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Proceedings of the American Academy of Arts and Sciences.

VOL. 57. No. 18.—NOVEMBER, 1922.

RECORDS OF MEETINGS, 1921-22.

BIOGRAPHICAL NOTICES.

OFFICERS AND COMMITTEES FOR 1922-23.

LIST OF THE FELLOWS AND FOREIGN HONORARY
MEMBERS.

STATUTES AND STANDING VOTES.

RUMFORD PREMIUM.

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1. KENT, NORTON A. and TAYLOR, LUCIEN B.—The Grid Structure in Echelon Spectrum Lines. pp. 1-18. December, 1921. \$.75.
2. LOTKA, ALFRED J.—The General Conditions of Validity of the Principle of Le Chatelier. pp. 19-37. January, 1922. \$.75.
3. BRIDGMAN, P. W.—The Effect of Tension on the Electrical Resistance of Certain Abnormal Metals. pp. 39-66. April, 1922. \$1.00.
4. BELL, LOUIS.—Notes on the Early Evolution of the Reflector. pp. 67-74. February, 1922. \$.50.
5. BRIDGMAN, P. W.—The Effect of Pressure on the Thermal Conductivity of Metals. pp. 75-127. April, 1922. \$1.25.
6. BRIDGMAN, P. W.—The Failure of Ohm's Law in Gold and Silver at High Current Densities. pp. 129-172. April, 1922. \$1.25.
7. PIERCE, GEORGE W.—A Table and Method of Computation of Electric Wave Propagation, Transmission Line Phenomena, Optical Refraction, and Inverse Hyperbolic Functions of a Complex Variable. pp. 173-191. April, 1922. \$1.25.
8. PIERCE, GEORGE W.—Artificial Electric Lines with Mutual Inductance between Adjacent Series Elements. pp. 193-212. May, 1922. \$1.25.
9. BARKER, FRANKLIN D.—The Parasitic Worms of the Animals of Bermuda. I. Trematodes. pp. 213-237. 3 pls. May, 1922. \$.65.
10. BENNITT, RUDOLF.—Additions to the Hydroid Fauna of the Bermudas. pp. 239-259. May, 1922. \$.65.
11. BRUES, CHARLES T.—Some Hymenopterous Parasites of Lignicolous Itonididae. pp. 261-288. 2 pls. May, 1922. \$.85.
12. THAXTER, ROLAND.—A Revision of the Endogoneae. pp. 289-350. 4 pls. June, 1922. \$1.25.
13. CLARK, H. L.—The Echinoderms of the Challenger Bank, Bermuda. pp. 351-362. 1 pl. June, 1922. \$.50.
14. SCHAEFFER, E. R.—Atmospheric Attenuation of Ultra-Violet Light. pp. 363-374. 1 pl. June, 1922. \$.65.
15. ROMBERG, ARNOLD.—The Ratio of the Calorie at 73° to that at 20°. pp. 375-387. June, 1922. \$.65.
16. BOWEN, ROBERT H.—Studies on Insect Spermatogenesis. IV. The Phenomenon of Polymegaly in the Sperm Cells of the Family Pentatomidae. pp. 389-422. 2 pls. November, 1922. \$1.65.
17. THAXTER, ROLAND.—Note on Two Remarkable Ascomycetes. pp. 423-436. 2 pls. September, 1922. \$1.35.
18. RECORDS OF MEETINGS; Biographical Notices; Officers and Committees; List of Fellows and Foreign Honorary Members; Statutes and Standing Votes, etc. pp. 437-567. November, 1922. \$.75.



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RECORDS OF MEETINGS, 1921-22.

BIOGRAPHICAL NOTICES.

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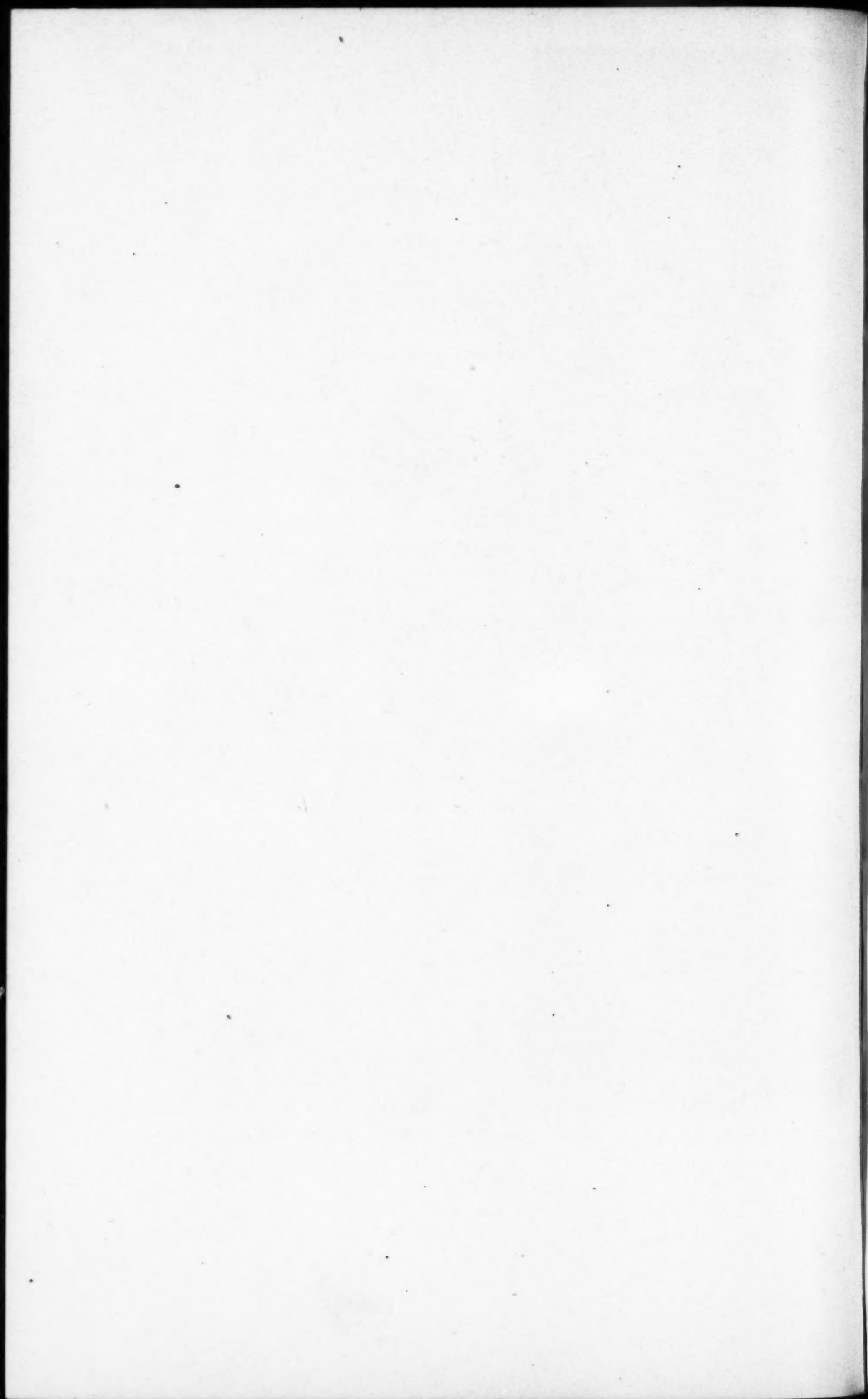
LIST OF THE FELLOWS AND FOREIGN HONORARY
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RECORDS OF MEETINGS.

One thousand one hundred and fifth Meeting.

OCTOBER 19, 1921.—STATED MEETING.

The Academy met at its House.

The PRESIDENT in the Chair. The Transactions of the last two meetings were read and approved.

There were twenty-two Fellows and one guest present:

The following letters were presented by the Corresponding Secretary: — from C. G. Abbot, W. C. Abbott, I. Babbitt, S. J. Barnett, J. S. Bassett, E. W. Berry, N. L. Bowen, J. C. Branner, C. D. Buck, F. Cajori, C. M. Campbell, L. L. Campbell, R. Cole, C. Day, W. F. Durand, R. A. Emerson, F. E. Farley, M. Farrand, W. S. Ferguson, E. C. Franklin, P. R. Frothingham, R. G. Harrison, W. E. Hocking, W. H. Howell, W. J. Humphreys, E. X. L. H. Hyvernath, F. E. Ives, C. F. Jenney, A. Keith, O. D. Kellogg, J. F. Kemp, F. Lawton, J. G. Lipman, J. L. Lowes, C. D. Maginnis, C. T. Main, W. J. Mayo, J. C. Merriam, E. D. Merrill, G. S. Miller, W. Patten, F. W. Peabody, W. L. Phelps, C. V. Piper, C. R. Post, H. N. Russell, F. Schlesinger, A. W. Scott, J. Stebbins, C. W. Stiles, W. S. Thayer, C. H. Walker, J. Warren, David White, Arthur Winslow, accepting Fellowship; from Hugo de Vries, G. H. Hardy, G. A. F. Molengraaff, accepting Foreign Honorary Membership; from A. W. Whitcher, presenting a framed photograph of Gainsborough's portrait of Sir Benjamin Thompson, recently bequeathed to Harvard College; from Miss Susanna Willard, presenting a silhouette of Rev. Joseph Willard, Vice-President and Corresponding Secretary of the Academy from 1780-1804; from the University of Virginia, presenting a medal commemorating its 100th anniversary; from the Wisconsin Academy of Sciences, presenting a medal commemorating its 50th anniversary; from the Rumford Historical Association thanking

the Academy for a replica of the first Rumford medal; from the Reale Università di Padova announcing the celebration of its 700th anniversary; from R. S. Woodward giving an account of the centennial of the University of Virginia.

The Chair announced the death of the following Fellows: Joel Asaph Allen, Class II., Section 3; Charles Pickering Bowditch, Class III., Section 2; Eliot Channing Clarke, Class I., Section 4; Hiram Francis Mills, Class I., Section 4; and of the Foreign Honorary Member Julius von Hann, Class II., Section 1.

A biographical notice of Edward Charles Pickering, by J. H. Metcalf was presented by the Corresponding Secretary.

The President stated that a Conference of Orientalists was held at the invitation of Class III., Section 2, of the Academy, in the House of the Academy, on October 5th.¹

The following communication was presented: Professor C. B. Gulick, "The Greek Novel."

The following papers were presented by title:

"The General Conditions of Validity of the Principle of Le Chatelier," by Alfred J. Lotka. Presented by Irving Fisher.

"The Grid Structure in Echelon Spectrum Lines," by Norton A. Kent and Lucien B. Taylor.

"Effect of Tension upon Resistance of Abnormal Metals," by P. W. Bridgman.

"Effect of Pressure on Thermal Conductivity," by P. W. Bridgman.

"The Failure of Ohm's Law in Gold and Silver at High Current Densities," by P. W. Bridgman.

"Waverley Researches in the Pathology of the Feeble-Minded," by W. E. Fernald, E. E. Southard, M. M. Canavan, O. J. Raeder, and A. E. Taft.

"The Early Evolution of the Reflecting Telescope," by Louis Bell.

The meeting was then dissolved.

¹ For the record of this meeting see p. 460.

One thousand one hundred and sixth Meeting.

NOVEMBER 9, 1921.—STATED MEETING.

The Academy met at its House.

The PRESIDENT in the Chair.

The Transactions of the last meeting were read and approved.

There were thirty Fellows and two guests present:

The following communications were presented:

Louis Bell, "The Early Evolution of the Reflecting Telescope."

Discussion followed by A. G. Webster, E. Thomson, H. Cushing, W. S. Bigelow, and others.

Desmond FitzGerald, "On a great Collection of Skeletons of Animals from Prehistoric Times at the Rancho la Brea, near Los Angeles, California."

Discussion followed by W. M. Davis.

A. G. Webster, "Hermann von Helmholtz and his Significance for a Century of Science."

C. R. Lanman exhibited specimens of Helmholtz's autograph.

The Meeting was then dissolved.

One thousand one hundred and seventh Meeting.

DECEMBER 14, 1921.—STATED MEETING.

The Academy met at its House.

The PRESIDENT in the Chair.

The Transactions of the last meeting were read and approved.

There were thirty-nine Fellows and two guests present:

The Corresponding Secretary reported acceptances of Fellowship from:

F. S. Converse, A. P. Davis, William Emerson, C. M. T. Loeffler, H. A. Pilsbry, A. A. Young, and a resignation of Fellowship from R. A. Cram.

The President announced the death of Charles Robert Cross, Class I., Section 2; Chairman of the Rumford Committee since 1898.

The Librarian reported the gift to the Library from Admiral

F. T. Bowles of a set of the Transactions of the Institution of Naval Architects (London), and a set of the Transactions of the Society of Naval Architects and Marine Engineers (New York), with the offer to continue during his lifetime the gift of the volumes of these sets as they appear.

The following communications were presented:

Edward P. Warner, Professor of Aëronautical Engineering in the Massachusetts Institute of Technology, "Recent Developments in Aëronautical Science." (With lantern slide illustrations.)

Robert DeC. Ward, "Some Meteorological Phenomena in Relation to Flight."

Alexander McAdie, "Aërography." (With lantern slide illustrations.)

The Meeting was then dissolved.

One thousand one hundred and eighth Meeting.

JANUARY 7, 1922.— OPEN MEETING.

An Open Meeting was held at the House of the Academy from four to six o'clock.

The PRESIDENT in the Chair.

There were about two hundred and twenty-five Fellows and guests, including ladies, present.

Mr. Harlow Shapley, Director of the Harvard University Observatory, spoke on "The Galaxy: Its Content and Dimensions," with lantern slide illustrations.

Tea was served in the Reception Room on the third floor.

One thousand one hundred and ninth Meeting.

JANUARY 11, 1922.— STATED MEETING.

The Academy met at its House, on a night made formidable by cold and storm.

The PRESIDENT in the Chair.

The Transactions of the last Meeting were read and approved.
There were fifteen Fellows present:

The Corresponding Secretary presented a letter of resignation of Fellowship from W. T. Councilman.

The following proposed amendment to the Statutes was referred to a Committee consisting of the Corresponding and Recording Secretaries:

Chapter III, Article 2, second and last paragraphs, strike out after the word Fellow, "having the right to vote."

On the recommendation of the Council it was

Voted, To make the following appropriation from the income of the General Fund:

\$300 for General Expenses.

\$300 for House Expenses.

The following communication was presented:

G. A. Reisner, "Archeological Methods Used by the Harvard-Boston Expedition." (With lantern slide illustrations.)

The following papers were presented by title:

"Some Hymenopterous Parasites of Lignicolous Itonididæ,"
by C. T. Brues.

"A Table and Method of Computation of Electric Wave Propagation and Transmission Line Phenomena," by G. W. Pierce.

"Artificial Electric Lines With Mutual Inductance Between Adjacent Series Elements," by G. W. Pierce.

"The Dioptrics of the Eye As Related to Pictorial Art," by Adelbert Ames, Jr., presented by Louis Bell.

The Meeting was then dissolved.

One thousand one hundred and tenth Meeting.

FEBRUARY 8, 1922.—STATED MEETING.

The Academy met at its House.

The PRESIDENT in the Chair.

The Transactions of the two last Meetings were read and approved.

There were twenty-seven Fellows present:

The Corresponding Secretary announced the receipt of the following biographical notices:

Charles Pickering Bowditch, by A. M. Tozzer.

Barrett Wendell, by Robert Grant.

The President announced the death of James Bryce, Viscount Bryce, Foreign Honorary Member, Class III., Section 3.

The President announced that an invitation had been received from the Académie Royale de Belgique, inviting the Academy to take part in the celebration of its 150th anniversary on May 24, 1922.

It was

Voted, To ratify the vote taken at the last meeting, no quorum being then present, appropriating \$600 from the General Fund, to be applied, \$300 to General Expenses and \$300 to House expenses.

The special Committee for an amendment to the Statutes, Chapter III., Art. 2, second and last paragraphs, to strike out after the word Fellow the words "having the right to vote," reported, recommending that the amendment be adopted; and, a ballot having been taken, it appeared that the amendment was adopted, twenty votes being cast in the affirmative, and none in the negative.

The President stated that he had appointed E. H. Hall a member of the Committee on Biographical Notices.

The following communication was presented:

W. B. Cannon, "New Evidence for Nervous Control of Some Internal Secretions." (With lantern slide illustrations.)

The following paper was presented by title:

"Atmospheric Attenuation of Ultra-Violet Light," by E. L. Schaeffer, presented by Theodore Lyman.

The Meeting was then dissolved.

One thousand one hundred and eleventh Meeting.

MARCH 8, 1922.—STATED MEETING.

The Academy met at its House.

The PRESIDENT in the Chair.

The Transactions of the last Meeting were read and approved.

There were forty-three Fellows and several guests present:

The Corresponding Secretary announced the receipt of an invitation from the Royal University of Padua inviting the Academy to take part in the VII centenary of its foundation, May 14-17, 1922; and an invitation from the Société Asiatique de Paris to send delegates to take part in the 100th anniversary of its founding, July 10-13, 1922.

The Corresponding Secretary announced the receipt of the following biographical notices:

John Wallace Baird, by R. M. Yerkes.

William Gilson Farlow, by C. L. Jackson.

The President announced the death of Charles Leonard Bouton, Class I., Section 1.

On recommendation of the Council, the following appropriations were made for the ensuing year:

From the income of the General Fund, \$8,300.65, to be used as follows:

for General and Meeting expenses	\$1,300.00
for Library expenses	3,000.00
for Books, periodicals and binding	1,100.00
for House expenses	2,300.00
for Treasurer's expenses	600.00

From the income of the Publication Fund, \$3,951.95, to be used for publication.

From the income of the Rumford Fund, \$6269.65, to be used as follows:

for Research	\$1,000.00
for Purchase and binding of books and periodicals	200.00
for Publication	600.00
for use at the discretion of the Committee	4,469.65

From the income of the C. M. Warren Fund, \$1,842.44, to be used at the discretion of the Committee.

E. B. Wilson reported for the Committee on Membership, proposing amendments to the Statutes as follow:

(1) to amend Chapter II., Art. 2, by substituting "Two hundred and ten" for "Two hundred" in the third line.

(2) to amend Chapter IX., Art. 1, third paragraph, by omitting the words "of the same Class."

The President appointed the Nominating Committee for officers for the ensuing year, 1922-23, as follows:

G. D. Birkhoff, of Class I.

C. H. Warren, of Class II.

Frederic Dodge, of Class III.

The following communication was presented:

Adelbert Ames, Jr., "The Physiology of Vision and the Technique of Art."

The following papers were presented by title:

"Additions to the Hydroid Fauna of the Bermudas," by Rudolf Bennitt, presented by E. L. Mark.

"The Parasitic Worms of the Animals of Bermuda: I. Trematodes," by F. D. Barker, presented by E. L. Mark.

The Meeting was then dissolved.

One thousand one hundred and twelfth Meeting.

MARCH 11, 1922.—OPEN MEETING.

An Open Meeting was held at the House of the Academy from four to six o'clock.

The PRESIDENT in the Chair.

There were about one hundred Fellows and guests, including ladies, present.

Professor George Grafton Wilson, of Harvard University, spoke on "The Recent Conference on the Reduction of Armaments."

Tea was served in the Reception Room on the third floor.

One thousand one hundred and thirteenth Meeting.

APRIL 8, 1922.—SPECIAL MEETING.

A special meeting of the Academy was held at its House on Saturday, April 8, at four o'clock in the afternoon to receive Professor Hendrik Antoon Lorentz of the University of Leiden, a Foreign Honorary Member of the Academy.

A number of Fellows, and guests upon their invitation, were present.

The President introduced Professor Lorentz who spoke on some features in the work of the late Josiah Willard Gibbs, Professor of Mathematical Physics in Yale College, and Fellow of the Academy.

At the close of the address an hour was spent socially in the upper room where tea was served.

One thousand one hundred and fourteenth Meeting.

APRIL 12, 1922.—STATED MEETING.

The Academy met at its House at 8.15 P.M.

The PRESIDENT in the Chair.

There were thirty-six Fellows present:

The Transactions of the meetings of March 8 and April 8 were read and approved.

The President announced the death of John Wilkes Hammond, Fellow in Class III., Section 1.

The Corresponding Secretary reported the receipt of a biographical notice of William Thompson Sedgwick by Edmund B. Wilson.

The President announced the appointment of C. H. Haskins and A. E. Kennelly to represent the Academy at the 150th anniversary of Académie Royale de Belgique, on May 24th; and of C. H. Haskins and C. H. Moore at the 700th anniversary of the University of Padua.

The following amendments to the Statutes were adopted:

Chapter II., Article 2, last line, add the words "and ten" so as to read "nor shall there be more than Two hundred and ten in any one Class."

Chapter IX., Article 1, paragraph 3, strike out the words "of the same Class."

The following Communications were presented:—

Mr. Elihu Thomson. "Laboratory Products."

Mr. John L. Lowes. "A Neglected Note Book of Coleridge."

The following papers were presented by title:—

"A Revision of the Endogoneae." By Roland Thaxter.

"The Echinoderms of the Challenger Bank, Bermuda." By Hubert L. Clark. Presented by E. L. Mark.

"The Heat of Vaporization of Mercury." By F. W. Loomis. Presented by P. W. Bridgman.

"The Joule-Thomson Effect in Air." By P. H. Royster. Presented by P. W. Bridgman.

"The Ratio of the Calorie at 73° to that at 20°." By Arnold Romberg. Presented by P. W. Bridgman.

The Meeting was then dissolved.

One thousand one hundred and fifteenth Meeting.

MAY 10, 1922.—ANNUAL MEETING.

The Academy met at its House at 8.15 P.M.

The PRESIDENT in the Chair.

Thirty-seven Fellows were present.

The Transactions of the Meeting of April 12 were read and approved.

Professor J. R. Jewett was appointed a delegate to represent the Academy at the celebration of the 100th anniversary of the Société Asiatique de Paris, July 10-13, 1922.

The Corresponding Secretary reported that the Council had transferred William Emerson, with his consent, from Class I., Section 4 to Class III., Section 4.

The Corresponding Secretary presented the following biographical notices: — Joel Asaph Allen, by H. C. Bumpus; Eliot Channing Clarke, by G. F. Swain; Henry Lee Higginson, by M. A. DeW. Howe; Franklin Paine Mall, by W. T. Councilman; John Elliot Pillsbury, by W. H. Dall; Elmer Ernest Southard, by C. M. Campbell; Andrew Dickson White, by W. D. Bancroft; Edward James Young, by W. W. Fenn.

The following report of the Council was presented: —

Since the last report of the Council, there have been reported the deaths of seven Fellows: Joel Asaph Allen, Charles Leonard Bouton, Charles Pickering Bowditch, Eliot Channing Clarke,

Charles Robert Cross, John Wilkes Hammond, Hiram Francis Mills; and two Foreign Honorary Members: Viscount Bryce, Julius von Hann.

Sixty-one Fellows and three Foreign Honorary Members were elected by the Council and announced to the Academy in May 1921. Two Fellows have resigned.

The roll now includes 569 Fellows and 67 Foreign Honorary Members (not including those elected in April 1922).

The annual report of the Treasurer, Henry H. Edes, was read, of which the following is an abstract:

GENERAL FUND.

Receipts.

Balance, April 1, 1921	\$8,495.29	
Investments	4,691.00	
Assessments	3,480.00	
Admissions	100.00	
Sundries	257.65	\$17,023.94

Expenditures.

Expense of Library	\$4,815.44	
Expense of House	2,386.91	
Treasurer	505.96	
Assistant Treasurer	250.00	
General Expense of Society	1,596.61	
President's Expenses	64.25	
Income transferred to principal	367.23	\$9,986.40

Balance, April 1, 1922	7,037.54	
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\$17,023.94

RUMFORD FUND

Receipts.

Balance, April 1, 1921	\$3,938.64	
Investments	4,110.92	
Sale of Publications	49.90	\$8,099.46

Expenditures.

Research	1,200.00	
Books, periodicals and binding	317.27	
Publications	392.58	
Sundries	73.50	
Income transferred to principal	186.89	\$2,170.24
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Balance, April 1, 1922		5,929.22
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		\$8,099.46

C. M. WARREN FUND.

Receipts.

Balance, April 1, 1921	\$4,226.62	
Investments	1,205.55	\$5,432.17

Expenditures.

Research	\$2,975.00	
Vault Rent, part	3.00	
Income transferred to principal	52.11	\$3,030.11
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Balance, April 1, 1922		2,402.06
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		\$5,432.17

PUBLICATION FUND.

Receipts.

Balance, April 1, 1921	\$4,470.01	
Appleton Fund investments	1,843.68	
Centennial Fund investments	2,441.28	
Authors' Reprints	73.87	
Sale of Publications	227.34	\$9,056.18

Expenditures.

Publications	\$3,738.73	
Vault Rent, Part	10.00	

Income transferred to principal	\$187.32	\$3,936.05
Balance April 1, 1922		5,120.13
		<u>\$9,056.18</u>

FRANCIS AMORY FUND

Receipts.

Investments	\$1,533.75
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Expenditures.

Publishing statement	\$55.60	
Interest on bonds bought	44.00	
Income transferred to principal	1,434.15	\$1,533.75

The following Reports were also presented: —

REPORT OF THE LIBRARY COMMITTEE.

The Librarian begs to report for the year 1921-22, as follows:

During the year, 87 books have been borrowed by 19 persons, including 13 Fellows and 2 libraries. Many books have been consulted and used at the Library. All books taken out have been returned or satisfactorily accounted for, except three.

The number of books on the shelves at the time of the last report was 37,543. 868 volumes have been added, making the number now on the shelves 38,411. This includes 170 purchased from the income of the General Fund, 54 from that of the Rumford Fund, and 644 received by gift or exchange.

The expenses charged to the Library during the financial year are:

Salaries	\$2,970.25
Binding: —	
General Fund	1,055.10
Rumford Fund	123.21

Purchase of periodicals and books:—

General Fund	760.93
Rumford Fund	221.62
Miscellaneous	2.10
	<hr/>
	\$5,313.21

ARTHUR G. WEBSTER, *Librarian*.

May 10, 1922.

REPORT OF THE RUMFORD COMMITTEE.

The Committee met on October 19, 1921. Professor Charles R. Cross expressed himself as unwilling to be a candidate for re-election to the Chairmanship, the matter of organization was therefore postponed.

Professor Cross died on November 16, 1921.

At a meeting held December 14, 1921, Theodore Lyman was elected Chairman and Arthur G. Webster, Secretary.

The following grants in aid of researches in light or heat have been made during the academic year 1921-22:

October 19, 1921. To Professor Norton A. Kent, of Boston University, for the purchase of a Lummer Plate; Additional to former appropriation (235) \$500

To Professor Harvey N. Davis, of Harvard University, in aid of his researches on the Improvement of the Design of Liquid Air Machinery (236) 300

April 12, 1922. To Professor Percy W. Bridgman, of Harvard University, for the continuation of his researches on the Thermal and Optical Properties of Matter under High Pressure; Additional to former appropriation (237) 500

To Professor Frederick A. Saunders, of Harvard University, in aid of his Spectroscopic Researches; Additional to former appropriation (238) 150

To Professor William Duane, Harvard University, for an Investigation on the Heat Energy of Electrons (239) 300

Reports of progress in their respective researches have been received from the following persons: R. T. Birge, P. W. Bridgman, W. W.

Campbell, A. L. Clark, F. Daniels, P. F. Gaehr, R. C. Gibbs, H. L. Howes, L. R. Ingersoll, N. A. Kent, F. G. Keyes, C. A. Kraus, C. L. Norton, F. Palmèr, Jr., J. A. Parkhurst, H. M. Randall, T. W. Richards, F. A. Saunders, W. O. Sawtelle, B. J. Spence, L. S. E. Thompson, O. Tugman, F. W. Very, A. G. Webster, D. L. Webster.

The following papers in the Proceedings have been published with aid from the Rumford Fund since the presentation of the last Report:

Awards of the Premium and Grants for Research in Light and Heat. Charles R. Cross, Vol. 56, No. 10.

The Grid Structure in Echelon Spectrum Lines. Norton A. Kent and Lucien B. Taylor, Vol. 57, No. 1.

The Effect of Pressure on the Thermal Conductivity of Metals. P. W. Bridgman, Vol. 57, No. 5.

The following papers have been approved for publication:

The Atmospheric Attenuation of Ultra-Violet Light, Dr. E. L. Schaeffer.

On the Ratio of the Calorie at 73° to that at 20°, Professor Arnold Romberg.

The Heat of Vaporization of Mercury, Professor F. W. Loomis.

The Joule-Thomson Effect in Air, P. H. Royster.

For nearly twenty-five years Professor Charles R. Cross acted as Chairman of the Rumford Committee. The members of the Committee wish to express their appreciation of his untiring devotion and to record their deep regret at his loss.

THEODORE LYMAN, *Chairman.*

May 10, 1922.

REPORT OF THE C. M. WARREN COMMITTEE.

The Committee had at its disposal at the end of the fiscal year in March 1921, \$4,501.03. During the year ending March 31, 1922, grants to the amount of \$2,875 were made. The balance on that date was \$1,626.03.

Since the last annual report awards have been made as follows:

To Professor Henry Fay, Massachusetts Institute of Technology, \$200 was granted June 1, 1921, for a research on the influence of nitrogen upon the case hardening of steels and the study of the heat treatment of beta-brasses.

To Professor H. H. Willard, University of Michigan, \$300 was granted June 1, 1921, for the study of an electrometric method of determining the endpoint in volumetric analysis.

To Professor R. L. Datta, Calcutta, India, \$400 was granted June 1, 1921, for a research on the determination of the temperature of explosion of endothermic substances.

To Professor D. A. MacInnes, Massachusetts Institute of Technology, \$100 was granted June 15, 1921, for work on liquid junction potentials.

To Professor L. J. Desha, Washington and Lee University, \$200 was granted September 23, 1921, for a study of the fluorescence of organic compounds.

To Professor V. K. Krieble, Jarvis Chemical Laboratory, Trinity College, \$100 was granted February 21, 1922, for a study of asphalts.

To Professor F. R. Brunel, Bryn Mawr College, \$200 was granted February 21, 1922, for work on the addition of halogen hydrides to unsaturated compounds.

To Professor C. James, New Hampshire College, \$500 was granted May 4, 1922, to be applied toward an investigation on the ytterbium earths.

To Professor Charles A. Kraus, Clark University, \$500 was granted May 4, 1922, to continue his work on the constitution of metallic substances.

Reports of progress have been received from Professors Brunel, Kraus, Conant, James, Fay, and MacInnes. The other recipients of grants have been asked to submit reports of their work.

The Chairman of the Committee is attempting to get as complete a collection as possible of reprints of the papers describing the work which has been assisted by grants from the Warren Fund in the past.

JAMES F. NORRIS, *Chairman*.

May 10, 1922.

REPORT OF THE PUBLICATION COMMITTEE.

During the twelve months since the presentation of the last annual report, from April 1, 1921 to March 31, 1922, there have been published No. 3 of Vol. 14 of the *Memoirs*, Nos. 5-11, inclusive, of Vol. 56

of the Proceedings, and Nos. 1 to 10, inclusive, of Vol. 57. Costs of printing, happily, show a slight falling off from the excessive prices of preceding years, which is partly offset by the increased use of plates and line engravings in the published papers. The financial statement is as follows:

Receipts.

Balance, April 1, 1921	\$5,882.10	
Appropriation	3,559.11	
Sales of publications	226.18	
Received for authors' reprints	75.03	\$9,742.42

Expenses.

Engraving, printing, and binding	\$3,450.92	
Cartage and mailing	277.97	
Committee's expenses	9.84	\$3,738.73
Balance, April 1, 1922		\$6,003.69

The above figures do not include the sum of \$382.58 received from the Rumford Committee for publication of Rumford papers.

Respectfully submitted,

LOUIS DERR, *Chairman.*

May 10, 1922.

REPORT OF THE HOUSE COMMITTEE.

The House Committee submits the following report for 1921-22.

With the balance of \$12.35 left from last year, an appropriation of \$2,500, and \$145 received from other societies for the use of the rooms, the Committee has had at its disposal the sum of \$2,657.35. The total expenditure has been \$2,531.91, leaving an unexpended balance on April 1, 1922, of \$125.44. The expenditure has been as follows:—

Janitor	\$925.00
Electricity { A. Light	169.53
{ B. Power	86.00

Coal {	Furnace	953.21
	Water Heater	30.50
	Care of Elevator	71.45
	Gas	62.29
	Water	8.80
	Telephone	78.18
	Janitor's Materials	10.78
	Upkeep	106.47
	Ash Tickets	29.70
		<hr/>
Total Expenditure		\$2,531.91

The amount \$145 contributed by other societies for the use of the building leaves the net expense of the House \$2,386.91.

Meetings have been held as follows:—

The Academy		
Stated meetings	. . . . .	8
Open meetings	. . . . .	3
Special meetings	. . . . .	4
American Antiquarian Society	. . . . .	1
Archaeological Institute	. . . . .	1
Colonial Dames	. . . . .	1
Colonial Society	4
Geological Club of Boston	2
Harvard-Technology Chemical Club	7
		<hr/>
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The rooms on the first floor have been used for Academy Council and Committee meetings and also by the Trustees of the Children's Museum.

Respectfully submitted,

JOHN OSBORNE SUMNER, *Chairman.*

May 10, 1922.

On the recommendation of the Treasurer, it was
Voted, That the Annual Assessment be \$10.00.

The annual election resulted in the choice of the following officers and committees:

GEORGE F. MOORE, *President*.
 ELIHU THOMSON, *Vice-President for Class I*.
 HARVEY CUSHING, *Vice-President for Class II*.
 ARTHUR P. RUGG, *Vice-President for Class III*.
 HARRY W. TYLER, *Corresponding Secretary*.
 CHARLES B. GULICK, *Recording Secretary*.
¹HENRY H. EDES, *Treasurer*.
 ARTHUR G. WEBSTER, *Librarian*.

Councillors for Four Years.

EDWARD V. HUNTINGTON, *of Class I*.
 CHARLES PALACHE, *of Class II*.
 WILLIAM C. WAIT, *of Class III*.
 KIRSOPP LAKE, *of Class III*.

Finance Committee.

HENRY P. WALCOTT, JOHN TROWBRIDGE,
 HAROLD MURDOCK.

Rumford Committee.

THEODORE LYMAN, LOUIS BELL,
 ARTHUR G. WEBSTER, PERCY W. BRIDGMAN,
 ELIHU THOMSON, HARRY M. GOODWIN,
 CHARLES L. NORTON.

C. M. Warren Committee.

JAMES F. NORRIS, WALTER L. JENNINGS,
 HENRY P. TALBOT, ARTHUR D. LITTLE,
 GREGORY P. BAXTER, LAWRENCE J. HENDERSON,
 FREDERICK G. KEYES.

¹ Died October 13, 1922.

Publication Committee.

LOUIS DERR, of Class I.
HERBERT V. NEAL, of Class II.
ALBERT A. HOWARD, of Class III.

Library Committee.

HARRY M. GOODWIN, of Class I.
THOMAS BARBOUR, of Class II.
WILLIAM C. LANE, of Class III.

House Committee.

JOHN O. SUMNER,
WM. STURGIS BIGELOW, ROBERT P. BIGELOW.

Committee on Meetings.

THE PRESIDENT, GEORGE H. PARKER,
THE RECORDING SECRETARY, EDWIN B. WILSON,
EDWARD K. RAND.

Auditing Committee.

GEORGE R. AGASSIZ, JOHN E. THAYER.

The Council reported that the following gentlemen were elected members of the Academy: —

Class I., Section 1 (Mathematics and Astronomy):

Walter Sydney Adams, of Pasadena, California, as Fellow.

Arthur Stanley Eddington, of Cambridge, as Foreign Honorary Member.

Class I., Section 2 (Physics):

Edwin Crawford Kemble, of Cambridge, as Fellow.

Class I., Section 3 (Chemistry):

Richard Chase Tolman, of Washington, as Fellow.

Class I., Section 4 (Technology and Engineering):

Gano Dunn, of New York, as Fellow.

Thomas Alva Edison, of New Jersey, as Fellow.

Class II., Section 1 (Geology, Mineralogy, and Physics of the Globe):

Emmanuel de Margerie, of Paris, as Foreign Honorary Member.

Austin Flint Rogers, of Palo Alto, as Fellow.

Class II., Section 2 (Botany):

William Henry Weston, Jr., of Cambridge, as Fellow.

Class II., Section 3 (Zoölogy and Physiology):

Nathan Banks, of Cambridge, as Fellow.

Thorne Martin Carpenter, of Boston, as Fellow.

Alfred Clarence Redfield, of Boston, as Fellow.

Class II., Section 4 (Medicine and Surgery):

Sir Thomas Clifford Allbutt, of Cambridge, as Foreign Honorary Member.

Stanley Cobb, of Ponkapoag, as Fellow.

Joseph Lincoln Goodale, of Boston, as Fellow.

Robert Williamson Lovett, of Boston, as Fellow.

Class III., Section 1 (Philosophy and Jurisprudence):

William McDougall, of Cambridge, as Fellow.

Class III., Section 3 (Political Economy and History):

Edward Channing, of Cambridge, as Fellow.

George La Piana, of Cambridge, as Fellow.

Henri Pirenne, of Ghent, as Foreign Honorary Member.

Class III., Section 4 (Literature and Fine Arts):

Arthur Kingsley Porter, of Cambridge, as Fellow.

Paul Joseph Sachs, of Cambridge, as Fellow.

Charles Henry Conrad Wright, of Cambridge, as Fellow.

Monsieur J. Cavalier, Professor in the School of Science of the University of Toulouse and Rector of the University, addressed the Academy.

The following paper was presented by title: "The Phenomena of Polymegaly in the Sperm-Cells of the Family Pentatomidae." By Robert H. Bowen. Presented by Edmund B. Wilson.

The Meeting was then dissolved.

OCTOBER 5 AND 6 AND 7, 1921.—SPECIAL MEETING OF ORIENTALISTS.

A Special Meeting was held at the House of the Academy, beginning on Wednesday morning, the 5th of October, at ten o'clock, when the Academy received the Delegates from the Société Asiatique of Paris and the Royal Asiatic Society of London, deputed to confer with the members of Class III of the Academy upon matters concerning the promotion of Oriental studies.

A series of joint meetings of Orientalists was begun at London in 1919, and continued at Paris in 1920. This meeting of 1921 was held as a continuation of that series. In July, 1922, the French Society will celebrate the centenary of its foundation, and in 1923 the British Society will follow suit. Not until 1924 would another opportunity recur for holding such a meeting in America.

Accordingly, pursuant to a vote of the Council of the American Academy, an invitation was sent on April 13, 1921 to the Société Asiatique, the Royal Asiatic Society, and the Società Asiatica Italiana, to meet with the members of Class III of the Academy, on the 24th of June, 1921, or at such later time as might appear more convenient, and at the House of the Academy, in the city of Boston.

The invitation was authorized by the Council of the Academy at the instance of several gentlemen,—Americans, Orientalists, friends of the Orient and of Oriental learning,—whose names follow: Dr. William Sturgis Bigelow, of Boston; Professor James H. Breasted, of the University of Chicago; Mr. Charles Dana Burrage, of Boston; Professors Albert T. Clay and Charles C. Torrey, of Yale University; Dr. Arthur Fairbanks, of the Museum of Fine Arts, Boston; Professors James R. Jewett, Charles R. Lanman, George Foot Moore, and James H. Woods, of Harvard University; Professor Duncan B. Macdonald, of Hartford Theological Seminary.

The invitation was most cordially and promptly accepted,—on behalf of the French Society, by its President, Mr. Émile Senart, Member of the Academy of Inscriptions and Belles-Lettres of the Institute of France, and on behalf of the English Society, by its

President, Lord Reay (deceased August 1, 1921), of the British Academy. For the Italian Society, its President, Professor Pavolini of Florence, wrote that the Ministry held out hopes that the sending of a Delegate might be sanctioned. Unfortunately, these hopes were not realized.

The French Society's Delegates were: Paul Pelliot, Member of the Academy of Inscriptions and Belles-Lettres of the Institute of France, Professor of Chinese at the Collège de France; Alexandre Moret, Director of Studies at the École Pratique des Hautes Études, Conservator of the Musée Guimet in Paris.

The Delegates of the English Society were: Dr. Arthur Ernest Cowley, Fellow of Magdalen College, Oxford, Librarian of the Bodleian Library; Dr. Stephen Langdon, Professor of Assyriology at Oxford; Herbert Weld-Blundell, Esq., of London (Queen's College, Oxford); Mr. Henry Lee Shuttleworth, of Delhi, of the Indian Civil Service.

Upon the Academy's invitation, the American Oriental Society sent the following Delegates: its President, Reverend James Buchanan Nies, of Brooklyn Heights, New York; Dr. William Sturgis Bigelow, of Boston; Professor James H. Breasted, of the University of Chicago; Charles Dana Burrage, Esq., of Boston; Professor Albert T. Clay and Professor Edward Washburn Hopkins, of Yale; Professor A. V. Williams Jackson, of Columbia University; Professor Charles Cutler Torrey, of Yale.

All these were present, except Professor Clay.

The non-resident Delegates, during their stay, were the guests of The Omar Khayyam Club of America. With two or three exceptions, they were lodged and entertained by the Omar Club at the House of the Harvard Club of Boston.

The Delegates were received by the following Fellows of the Academy; the President of the Academy, Professor George Foot Moore; his immediate predecessor, Professor Theodore William Richards; the Corresponding Secretary of the Academy, Professor Harry W. Tyler; the Recording Secretary of the Academy, Professor James Hardy Ropes; President Lowell of Harvard; Mr. John Ellerton Lodge, of the Boston Museum of Fine Arts; Mr. Edward Sylvester Morse, of the Peabody Museum, Salem; Dr. Francis H. Williams, of Boston; Professors James Richard Jewett,

Kirsopp Lake, Ephraim Emerton, Charles R. Lanman, David G. Lyon, Clifford Herschel Moore, George Andrew Reisner, and James Haughton Woods, of Harvard.

SESSIONS OF WEDNESDAY, OCTOBER 5, 1921.

President Moore opened the sessions by welcoming to the Academy the Delegates of the Oriental Societies, and spoke briefly of the purpose and spirit of the joint meeting.

Professor Pelliot responded on behalf of the visitors. Moreover, as bearer of an official message to the Academy, he read a letter addressed to President Moore by M. Senart, of the Institute of France, as President of the Société Asiatique. The letter tells of the satisfaction of the Society at the establishment of relations of sympathy and coöperation with the Academy, and of its hope for long and fruitful maintenance of these relations. In particular, it tells of the proposed celebration in the early days of July, 1922, of the hundredth anniversary of the founding of the French Asiatic Society, and expresses the hope that the Academy will take part on that occasion.

Professor Hopkins, of Yale, in response to a call from the Chair, gave a brief account of the recent progress of American studies in the literature of India.

Professor Torrey, of Yale, in like manner, spoke of the progress of Semitic studies, with some account of the collections of Semitic antiquities in the Museums at Philadelphia, Yale, Harvard, Princeton, and New York (collection of J. Pierpont Morgan).

Professor Reisner, of Harvard, reviewed the work of American philologists and archæologists in the Egyptian field, and mentioned the notable collections of Egyptian antiquities in American Museums.

Professor Lyon, of Harvard, finally, gave some account of the Harvard Semitic Museum, and of the Harvard Excavations at Samaria.

The assembled company then proceeded in motor-cars to the Boston Museum of Fine Arts. The Director, Dr. Arthur Fairbanks, being detained at home by illness, the visitors were received

by the Acting-Director, Mr. Hawes. They were the guests of the Museum at luncheon. In the afternoon, they were conducted, some through the Egyptian Rooms by Dr. Reisner, and others through the Japanese Rooms by Mr. John Ellerton Lodge. The Delegates and their hosts dined together at the Harvard Club.

During the afternoon, Dr. Reisner gave an account of his twenty-two years of archaeological research in Egypt, illustrated by the objects now on exhibition, of which the most notable are: 1. Eleven sculptures in the round of Chephren, Mycerinus, Shepse-skaf, and other members of the royal family of the Fourth Dynasty; 2. Two sculptures in the round of prime importance, and many lesser statues and reliefs of the Old Empire; 3. The statue of the Lady Sennuwyt, and the painted wooden coffin of the monarch Dehuti-nekht, both of the Middle Ethiopian Monarchy (900-300 B.C.), the other half of which is in Khartum.

SESSIONS OF THURSDAY, OCTOBER 6, 1921.

President Moore called the assembly to order at ten o'clock.

Dr. Arthur Ernest Cowley, of Oxford, Librarian of the Bodleian Library, spoke upon the Hittite hieroglyphic inscriptions. He believes that they belong to the ninth and eighth centuries B.C., and that their language is connected with that of the inscriptions of Van, the ancient Armenian tongue.

Dr. Cowley laid stress on the distinction between these and the earlier cuneiform Hittite texts. We cannot assume without proof that the language of the Carchemish inscriptions is the same as that of the cuneiform tablets of Boghaz-keui. Nor can we even be sure that the signs always have the same values and conceal the same language at Tyana and Marash, for instance, as at Carchemish. Still we may continue to call the inscriptions Hittite, since the Assyrians spoke of the king of Carchemish as Šar mat Hatti, and since the king of Carchemish also called himself by a similar title, Lord of Hana, ruler of Hattina, according to Dr. Cowley's decipherment. Hana, at the confluence of the Habur with the Euphrates, and Hattina, the district to the west of Carchemish, are mentioned together in the Cappadocian texts just

published by Mr. Sidney Smith for the British Museum. These places were on the caravan route to Babylon, and Carchemish was bound to keep possession of them.

In the inscriptions of Carchemish three successive kings are named, and the last inscription mentions a name which is deciphered as Sarduris. This must be Sarduris II of Van, who had various dealings with the Hittites, as is known from the Vannic inscriptions. His date, and therefore the date of the last of the three kings of the Carchemish inscriptions, is about 750 B.C. Other indications corroborate this conclusion, so that the dates of this group of texts may be taken to fall between 850 and 750 B.C. They are thus contemporary with the inscriptions of the neighboring kingdom of Van, with which also there seems to be some linguistic connexion. Several comparisons were made with Vannic grammar and vocabulary.

Mr. Alexandre Moret, of Paris, Conservateur of the Musée Guimet, speaking in French, then followed. The title of his paper was: *L'accès de la plèbe aux droits religieux et politiques en Egypte*.

A visit to the splendid Egyptian galleries of the Boston Museum of Fine Arts shows what a contrast there is between the funerary monuments of the Old Empire and those of the Middle Empire. Among the former, the superb statues of king Mycerinus and his family are most notable; among the latter, the magnificent coffins of private individuals. This change implies nothing less than a religious and social revolution. Under the Old Empire (3000 to about 2600 B.C.), the king admits to religious and administrative functions only his relatives, friends, courtiers. And to them alone he accords participation in the funerary rites which assure survival in the other world. In Egypt, as in Greece and Rome, religious rights blend with political rights. To play a rôle in society, one must take some part in the religious rites of which the king, son of the gods, god himself, is the sole dispenser among men.

Beginning with the Middle Empire, about 2000 B.C., all is changed. The funerary monuments, by their character and increasing number, make it evident that every man has meantime gained access to the much-valued religious and funerary rites. Every man, no matter whether he be a plebeian or of the royal

family, whether favored by the king or not, may now possess a tomb, a coffin, a stele, may have the attributes of a king in the other world, and may claim as such to bear a sceptre and to wear a crown and the royal apparel. These things are depicted upon the sides of the coffins of common people. The sacred rites which were formerly known only to the king are now known to all. From a religious point of view, society has become quite democratized.

Political and civil rights also have in the meantime been won by the common people. This appears from the steles and from the papyrus-texts of administrative and literary contents. These show that the royal administration now concedes to every man the right to enter upon a public career, to hold land for burial-places, and to use and dispose of royal lands (subject to the king's right of eminent domain), and the right to independent commercial and industrial activity (not, for instance, in the royal workshops alone), and to have recourse to the royal tribunals of justice by right of petition, formerly accorded only to the higher classes. Society has been levelled under a monarchy which, although of divine right, has become democratized.

This rise of the common people, in the period between the Old and the Middle Empires (say from 2800 to 2000 B.C.), was not brought about without violent crises, which, as in Greece and Rome, wear the aspect of a social revolution. A description of these changes may be found in the texts which Professor James H. Breasted has commented upon and coördinated in the seventh chapter of his *Development of Religion and Thought in Ancient Egypt*. The beautiful coffins of the time of the Middle Empire attest the results of the social and political struggles involved.

Dr. Stephen Langdon, Professor of Assyriology at Oxford, presented the results of his studies upon the Babylonian Poem of the Righteous Sufferer. His reconstruction of the poem upon the basis of tablets from Niniveh and Sippur and Assur shows striking resemblances to the Hebrew Book of Job.

Dr. Langdon announced the recovery of several new texts which supply missing sections of the Babylonian poem. It now appears that the poem consisted of four books, each of about 120 lines, written in strophes of ten lines each. The book was written by an orthodox poet of the ninth century B.C., as an apology or

defence of traditional theology against the current pessimism and skepticism of the time. This legend of a righteous and orthodox man unjustly afflicted with poverty and disease, originated in Sumer, and was known as early as the twenty-fifth century.

The Righteous Sufferer was a resident of Nippur, named Lalur elimma, "Good is the protection of Enlil." The Semitic poem, as now reconstructed from texts of the late period, utilizes some old Sumerian legend which has not been recovered. The poem contains a detailed statement of the pessimism of the day, and the orthodox reply thereto. The Righteous Sufferer challenges the justice of God and the ways of providence. The good suffer and the wicked prosper. Strict observance of the rituals availed not. The priests of the mysteries and divination failed to avert the afflictions sent by the gods. This righteous man had committed no sin, and yet he was daily visited by divine punishment. Death is therefore preferable to life, and labor in the service of religion is futile.

After a long account of the current pessimism as illustrated by Lalur elimma's bitter complaint, the poet refers to the orthodox theory of rewards and punishments. Affliction is a certain indication of sin. If the sufferer has committed no offense against God, then his ancestors must have done so. The orthodox theory of original sin is expounded, and emphasis is laid on man's ignorance and God's impenetrable wisdom. Across the gulf between God and man, only prayer and ritual elicit a reply. Faith in the orthodox rituals finally triumphs over skepticism, and the Righteous Sufferer receives a revelation by divination, and sees that his virtue will soon receive its reward. He is restored to health and prosperity, and the poem ends with a long hymn of praise to Marduk, god of Babylon, who intervened and delivered the believer. This later element of the poem shows that the work was finally issued from the school of the priesthood at Babylon, who redacted all the older poems in like manner to glorify their patron deity Marduk.

The *Poem of the Righteous Sufferer* forms one section of Mr. Langdon's volume, *Babylonian Wisdom*. This will contain also the recently recovered *Dialogue of Pessimism* and the *Books of Proverbs*.

On behalf of The Omar Khayyam Club of America, its President, Mr. Lanman, presented to each one of the Delegates a copy of Mr. Burrage's three volumes, to wit: 1. his "Twenty Years of The Omar Khayyam Club of America," (Boston, 1921); 2. his "Exact Facsimile of the rare and famous first edition of Edward FitzGerald's Rubaiyat of Omar Khayyam, the Astronomer-poet of Persia. Translated into English verse. London: Bernard Quaritch, Castle Street, Leicester Square, 1859"; and 3. his miniature edition of "The Rubaiyat of Omar Khayyam of Naishapur."¹ In presenting these gifts, the speaker said, for substance, somewhat as follows:

It would indeed be a doubtful compliment to give to you, in the House of this venerable Academy, the works of a sot and a materialist. Such a one, as Mr. Burrage observes,² many people suppose that Omar was. This belief is far from the truth. Like Demokritos of Abdera, Omar was one of the most learned men of his day, and with that learning went a deep religious conviction and feeling which we may not lightly deny. If any incline to doubt it, we may well ask them, Why did Cowell, who was the Professor of Sanskrit at Cambridge and Edward FitzGerald's teacher and friend,— Why did Cowell urge his pupil to the work of translating the Quatrains and aid him in the doing? For Cowell was one of the most devout Christians that ever combined learning with unaffected piety.

You, gentlemen, who, representing the Asiatic Societies, are today here present as duly accredited Delegates to the American Academy, are the guests of the Omar Club. It would ill comport with the dignity of the Academy if she should turn you over to the hospitality of a Club organized for mere conviviality. Happily, such is not the case. Its members do indeed set store by good-fellowship; but they have endeavored,— notably through the

¹ This last is about 1 inch by 2½ in size, and is an edition of twenty copies bound in full blue morocco, hand-tooled in gold, with inlays of red and green morocco, with jade jewel inset, and put in a case, and privately printed by the Rosemary Press for the Omar Club. A leaf following the title reads: "Dedicated by The Omar Khayyam Club of America to its guests, the Delegates of the *Société Asiatique*, *Royal Asiatic Society*, *Società Asiatica Italiana*, and *American Oriental Society*, as a souvenir of their Joint-meeting with the *American Academy of Arts and Sciences* at Boston, in October, 1921."

² "Twenty Years," page 17.

labors of Eben Francis Thompson,¹ the founder of the Club,—to earn the respect and gratitude of scholars and men of letters, by making possible a right estimate of Omar as mathematician and teacher and poet, and by setting in a true light the relations of FitzGerald's consummate poetry to its Persian original.

In his "Quatrains from the Greek," Walter Leaf speaks of "the pathos of human life, its vanity and vexation, its brevity and uncertainty, with the background of 'the veil through which we cannot see' and the recurrent refrain, 'Let us eat and drink, for tomorrow we die.'" He adds that "the genius of FitzGerald has given us . . . what is, for our own day, a classical form for this poignant theme."

FitzGerald himself, in his once despised first edition (page xiii), says of Omar's poetry: "Any way, the Result is sad enough: saddest perhaps when most ostentatiously merry: any way, fitter to move Sorrow than Anger toward the old Tentmaker, who, after vainly endeavouring to unshackle his Steps from Destiny, and to catch some authentic Glimpse of Tomorrow, fell back upon Today as the only Ground he got to stand upon." FitzGerald's presentation of what seemed to him the essential features of Omar's philosophy of life has attained (as witness the editions and translations — for number, they pass belief) a popularity in which some would see a sign of the decadence of the age. Rather, let us look at Omar, — as that man² would have us do of whose loving labors and of whose gladness in gladdening others these books are the fruit, — let us look at Omar as one who would teach us the lessons of courage and hope and contentment and self-reliance, as one whose lessons, superimposed upon "the will to believe," shall teach us to make the most of the present through love of home and of country and of God.

At the close of the Session, the company took luncheon at Young's Hotel, and spent the afternoon visiting places of historic interest in the environs of Boston, such as Lexington and Concord. In the evening, it met again, informally, in Cambridge, at the house of Professor James R. Jewett of Harvard University.

¹ In his "Quatrains of Omar," collected and translated, and in his "FitzGerald's Omar," with a Persian text and close prose translation.

² Burrage, in "Twenty Years," page 101.

SESSIONS OF FRIDAY, OCTOBER 7, 1921.

The meeting was called to order at ten o'clock.

Dr. Nies, President of the American Oriental Society, gave an account of the Society's plans for the establishment of a School of Living Oriental Languages, and of its recent steps for enlarging its resources with a view to more extensive publication of works upon the Orient.

Professor Pelliot spoke upon Native and Foreign Scholarship in the field of Sinology, with an account of his explorations in Chinese Turkestan from 1906 to 1909, and in particular of the Grottoes of Touen-houang, and of the vast importance of their contents for the future investigation of the history of China.

Mr. Shuttleworth described a hill-festival in the Western Himalayas, and illustrated his description with pictures from his collections.

At the close of the formal Sessions, the afternoon hours were left unassigned, in order that the guests might use them for further study of the Egyptian and Japanese Galleries of the Museum, and for other similar visits.

A farewell gathering was held in the evening, in the Æsculapian Room of the Harvard Club. Here dinner was served, Mr. Lanman presiding. Brief addresses were made by President Lowell of Harvard, by Dr. Cowley of Oxford, by Professor Pelliot of Paris, by Mr. Burrage of Boston, and by Professor George Foot Moore of Harvard. The dominant note of these utterances was that of satisfaction over the opportunity which such meetings offer for personal acquaintance among the workers in these fields, and for mutual sympathy and encouragement.

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JOHN WALLACE BAIRD (1869-1919).

Fellow in Class II, Section 3, 1916.

In the untimely death of John Wallace Baird American science and particularly his science, psychology, have suffered a grievous loss. Born at Motherwell, Ontario, May 21, 1869, of Scottish parents, Baird early learned the virtues and rewards of self-reliance, devotion to duty, coöperation and loyalty.

He was one of twelve children, all of whom lived to celebrate the fiftieth anniversary of the marriage of their father and mother. Charles Baird, the father, was an industrious and successful Canadian farmer of sterling worth in home, church and state. The mother, Agnes Browning, possessed exceptional patience and wisdom and rare skill as singer of old ballads and narrator of family and neighborhood traditions.

Undoubtedly our colleague's essential education was gained at home. His formal education began in the "little red school house" and ended in the university. His undergraduate work in the University of Toronto was interrupted by years of school teaching, which enabled him to pay his own way. After graduating from the university in 1897, he devoted himself almost uninterruptedly to the study of psychology, first in his own university and subsequently in Leipzig. For two years he was a fellow in psychology at the University of Wisconsin and for one year at Cornell, where in 1902 he was granted the degree of doctor of philosophy. Thereupon he was appointed assistant in psychology at Cornell. After one year, this appointment was followed by that of research assistant in psychology, Carnegie Institution of Washington. At the end of his year's work as Carnegie research assistant, Baird accepted his first major academic appointment, that of instructor in psychology, Johns Hopkins University. This was followed after two years' service by appointment to an assistant professorship in psychology in the University of Illinois. In 1910, at the end of his fourth year in Illinois, he accepted an assistant professorship in psychology at Clark University, where, in 1913, he was given the status of professor of psychology.

Ever a serious minded and diligent student, Baird, at first alter-

nately and later simultaneously, studied and taught until he had mastered his chosen profession of teacher and investigator in psychology and had achieved academic position of eminence, influence and rare opportunity for service. His appointment as Carnegie research assistant in psychology gave him an excellent chance to demonstrate his originality, resourcefulness and enthusiasm for research. The result of the year's work was a report on "The color sensitivity of the peripheral retina," which stands as his most important publication, for subsequently he gave himself increasingly to his advanced students and his research was conducted largely by and through them.

During nine years of fruitful service to Clark University, John Wallace Baird achieved immortality by training many able students for psychological research. With a genius for friendship he pursued his path of duty and opportunity single mindedly, whole heartedly and with entire forgetfulness of self. Honors he never sought; praise he shrank from. His students learned to respect, admire and love him because of his devotion to their interests and the obvious sincerity of his belief in constructive work in teaching and research.

In April, 1917, despite physical unfitness for the strain of work in Washington, Baird undertook to assist in directing the work of the committee for psychology of the National Research Council. In December he was compelled to go to the Johns Hopkins Hospital for treatment of a recurring malady and there, on February 2, 1919, in his fiftieth year, his life ended.

The career of our lamented colleague is a consistent lesson in unselfish and loyal devotion to family, friends, country and human welfare. His life clearly was sacrificed to duty, for his fatal illness with its frequent and long continued periods of acute pain resulted from a terrible ordeal of strength in which he saved others from a watery grave. The sort of sacrifice which he willingly made at a time of exceptional anxiety and risk, he continued to make throughout his life, defying bodily suffering and manfully doing his full duty until the end.

John Wallace Baird's life of generous service has received fitting tribute of respect and affection in a memorial volume bearing his name published by Clark University.

ROBERT M. YERKES.

ARLO BATES (1850-1918).

Fellow in Class III, Section 4, 1900.

Arlo Bates was born in East Machias, Maine, December 16, 1850, the son of Dr. Niran, and Susan (Thaxter) Bates. The strange name that was given to him was due to a family idiosyncrasy which originated with his grandfather, who had a theory that every man should have "a name that is all his own and nobody else's." So he called his son Niran; Niran upon the same principle begat Arlo, and Arlo in his turn begat Oric. You will search the dictionaries of biography and mythology in vain for any of these names, they are merely combinations of letters with no significance, but unique and calculated to impress the bearer from birth with the sense of individuality which was a family characteristic, not least strongly marked in the subject of this memoir.

He was educated at Bowdoin College, where he received the degree of S.B. in 1876, A.M. in 1879, and Litt.D. in 1894. Already while an undergraduate his strong instinct for literature as a profession began to manifest itself, he became the editor-in-chief of the college paper called *The Bowdoin Orient*, and thus started on his chosen career. Shortly after his graduation he resolved to try his fortune in Boston, and moved to the city in the same year, to remain a resident of it until his death on August 26, 1918.

His first venture in Boston was a paper which he named *The Broadside*. This led an unprosperous existence during the years 1878-79 and was then abandoned. In the following year he was made editor of the *Sunday Courier*, a journal which had once been highly esteemed, when it numbered among its contributors many of those whose names were associated with the *North American Review*, but had sadly degenerated when he took hold of it, and was living then chiefly on its name and advertisements. Its proprietor gave him a free hand in the conduct of his own columns, with the result that during the thirteen years that he remained its editor he was able to restore it to something of its old prestige. It became again one of the accepted Sunday papers, and was extensively read for its editorials, literary reviews and notes on current topics, for all of which he was responsible and most of which he wrote himself.

The period of his connection with the *Courier* was, in one respect at least, the happiest and also the most unhappy in his career, both the result of his marriage. In 1882 he was married to Miss Harriet L. Vose, of Brunswick, Maine, who under the name of Eleanor Putnam was a well-known magazine writer, and the author of a book on Old Salem. Their union was a singularly ideal and sympathetic one, sharing as they did to the full their intellectual tastes as well as their devotion to each other, but after only four years of this companionship she died, and to the end of his life he never ceased to mourn her. She left him one child, Oric, to whom his affection was transferred and centered more and more as the boy grew up.

His literary career began soon after his arrival in Boston. His first attempts were not successful in finding a publisher, but not discouraged by this experience he persevered, and in 1881 published his first novel, "Patty's Perversities." For the next twenty-seven years he continued a fairly regular output of novels, poems and essays, in spite of his arduous professional labors. "Who's Who in America" for 1916-17, the last volume issued before his death, gives a list of twenty-three titles with their dates, ending with "The Intoxicated Ghost" in 1908. While these books won and held for him the respect of his literary associates they did not achieve the wide popularity for which he had hoped, and it was doubtless the disappointment at this result which led him to abandon writing during the last ten years of his life. He was slow to recognize that his real strength lay not in fiction or poetry but in essays. Of these he published only three volumes, the two series of "Talks on Writing English" and the "Talks on the Study of Literature," all of which are of permanent value, and delightful reading because of his critical ability, his high standard of purity in the use of our language, and his exhilarating freedom of thought and expression.

In 1893 he resigned his position on the *Sunday Courier* to accept the professorship of English literature in the Massachusetts Institute of Technology. There he entered enthusiastically upon the most difficult task of his life and the one in which he achieved his greatest success. To imbue a lot of young students who went to the Tech to fit themselves for the most practical professions, with little or no time, as they thought, for "ornamental" studies, to imbue them with the sense that ability to express themselves in clear sound English should be an

essential element of their training, and that the basis of this should be a knowledge and appreciation of the masters of their language, was no easy matter in that atmosphere of practical work, but he did it. The testimony of many students who sat under him, as well as the commendation of his associates on the faculty, leave no doubt of that, and it is still further shown by the fact that many who were not regularly connected with the Institute enrolled themselves as special students in order to have the advantage of his teaching. During the twenty-three years that he occupied his position he maintained it on a level with the best teaching in any of our universities, and he had the satisfaction of knowing that the seed he had planted was bearing good fruit. But there was another and a darker side to the picture. The period of his service in the Tech was the most turbulent in its history. Controversies arose, spread and would not down. Questions of policy, administration, the possible union with Harvard, every kind of problem that can disrupt a governing board, were discussed, not always with academic calm. Divisions of opinion were sharp and sometimes bitter. Into these he threw himself whole-heartedly, strong as always in his convictions, and vehement in his expression of them. Even before the clouds rolled away he found himself in a minority, out of sympathy with the new spirit that was growing in the institution in spite of his efforts, distrustful of its changes, and unwilling as always to compromise. Disheartened at the outcome as well as by the slight prospect of continued usefulness under the conditions that had thus been brought about, he retired in 1915, shortly before the Tech moved from Boston to Cambridge, and three years before his death.

Thus another disappointment was added to his life, and if I seem to dwell unduly upon these it is because they are essential to a knowledge of his character and its development. Highly sensitive as he was, and of a temperament that was naturally prone to melancholy, he was less fitted than a more robust personality would have been to withstand these slings and arrows, for as such he regarded them.

No account of Arlo Bates would be complete without at least a reference to his association with the Tavern Club, where for twenty years it is hardly too much to say that he was the life and soul of the club, contributing to an extent equalled by few others towards the distinctive character which gave it its reputation. Always ready to prepare a skit, a burlesque, a miracle play, or any kind of original

entertainment, and equally ready to take part in any or all of them, the "moroseness" which many who did not know him well regarded as characteristic was there shown to be merely skin deep and easily punctured. Some of his wittiest and most brilliant work was done in the plays which he wrote for the club, and it is a pity that there was so small a public to enjoy them. But those who had the privilege will never forget it nor the affection in which they held him.

He was elected a Fellow of this Academy March 14, 1900, and a Member of the National Institute of Arts and Letters in 1904. An account of his life and work, with tributes from various sources, was published in the *Technology Review* for November, 1918, Vol. XX, pp. 615 ff.

EDWARD ROBINSON.

CHARLES PICKERING BOWDITCH (1842-1921).

Fellow in Class III, Section 2, 1892.

Charles Pickering Bowditch was born in Boston on September 30, 1842, and died in Jamaica Plain on June 1, 1921. He was the son of Jonathan Ingersoll Bowditch and Lucy O. (Nichols) Bowditch. He entered Harvard College in 1859 and was graduated in the Class of 1863 after having been suspended for his participation in some college pranks. He received the Master's Degree in 1866.

As a member of the Presidential party he witnessed Lincoln's First Inauguration on March 4, 1861. He served in the Civil War as 2d Lieutenant, 1st Lieutenant, and Captain in the 55th Massachusetts Volunteer Infantry and later he was Captain in the 5th Massachusetts Volunteer Cavalry of which his brother, Henry, was a Major.

He spent the year 1865 in the oil regions of Pennsylvania and from 1865 to 1872 he was in charge of the Estate of William W. Wadsworth at Geneseo, New York, and from 1866 to 1872 he was Trustee of the Estate of Allen Ayrault at the same place. He returned to Boston in 1872 and, except for periods of travel in Europe, the Orient, Mexico, Central America, and California, he resided in Boston until his death.

Mr. Bowditch's grandfather, Nathaniel Bowditch, was the Fifth President of the American Academy, serving from 1829 to 1838 and succeeding John Quincy Adams as President. His father, J. Inger-

soll Bowditch, was Treasurer of the Academy from 1842 to 1852. Mr. Charles P. Bowditch was elected a member of the Academy in 1892 and was its Treasurer from 1905 to 1915 and President from 1917 to 1919.

He was also a member of the following societies: Boston Society of Natural History, serving as Vice President from 1895 to 1907, the American Geographical Society, the American Antiquarian Society, and numerous American and European Anthropological organizations. His historical-genealogical interests are shown in his membership in the Massachusetts Historical Society, the Bostonian Society, the Colonial Society of Massachusetts, and the New England Historical-Genealogical Society. Each of these institutions is indebted to him for generous support. His varied interests are shown by this list of organizations of which he was a member. As a man of affairs he was an officer in many corporations and numerous benevolent enterprises and a Trustee of many estates.

After a pleasure trip to Mexico and Yucatan in 1888 his main avocation was the investigation of Central American antiquities and, more especially, the Maya system of hieroglyphic writing. In this study he was the most outstanding figure in America. His book, "The Numeration, Calendar Systems, and Astronomical Knowledge of the Mayas" (1910), was the most important book published up to that time on the Central American hieroglyphic writing. He added much to the knowledge of this subject and blazed a trail which will always remain open to future students of this subject. This book, together with numerous pamphlets, show the results of an acute mathematical mind and most painstaking study. He was a worthy foe to speculative theories and his deductions are based on mathematical calculations and sound common sense.

Mr. Bowditch's connection with the Peabody Museum of Harvard University was a long and a close one. From 1888 to the time of his death he was its greatest benefactor. In 1894 he became a Trustee of the Museum and always took the greatest personal interest in the welfare of the institution and its varied activities. His patronage of the Central American work of the Museum covered many sides. He financed and planned annual expeditions to the Maya field, beginning in 1891 and continuing in an almost unbroken series down to the present time. The scientific results of these expeditions were pub-

lished, for the most part at Mr. Bowditch's expense, in six folio volumes of Memoirs and several volumes of Papers. The collections acquired by these expeditions now fill the greater part of two large halls in the Museum. He brought together a large library of the books and manuscripts relating to Mexico and Central America which he gave to the Museum in addition to over fifty thousand pages of photographic reproductions of early manuscripts and rare books on the history and languages of these countries. He established Fellowships in Maya research in the Archaeological Institute of America and in the Peabody Museum. He was in great part responsible for the establishment of the teaching of Anthropology in Harvard University.

Mr. Bowditch's patronage of the study of Central American antiquities was a patronage based on personal investigations, study, and an intimate knowledge of this field. American Anthropology has perhaps no other case where an effort in one field of interest has been so long continued, so intense, and so productive of results.

A list of the published and unpublished articles written by him together with a list of his editorial work is printed in the *American Anthropologist* (N.S.) v. 23, 1921.

ALFRED M. TOZZER.

SETH CARLO CHANDLER (1846-1913).

Fellow in Class I, Section 1, 1883.

Seth Carlo Chandler was born in Boston, Mass., on September 16, 1846, the son of Seth Carlo and Mary (Cheever) Chandler. He died on December 31, 1913, after a career of remarkable achievement.

As a boy he developed early, showing a fine combination of mental and practical capability. While still attending the English High School of Boston, he was chosen to perform some computations for Professor Benjamin Pierce of Harvard University. This circumstance seems to have developed Chandler's mathematical bent and led him, after graduation in 1861, to become the assistant to the distinguished astronomer, Dr. B. A. Gould. While the other lads of sixteen years may have pursued collegiate courses, Chandler found in Gould his university. Here was the beginning of a life-long friendship. Under Gould he worked with the title of Aid in the U. S. Coast Survey from

1864 to 1870. On October 20, 1870, he married Caroline Margaret Herman of Boston, who with several daughters survives him. Dr. Gould was now in the Argentine Republic, founding the national observatory at Cordoba. Chandler had declined Gould's invitation to go with him, possibly having in view his impending marriage. Feeling now the need of more lucrative employment than afforded by science, he became life insurance actuary from 1870 to 1885. Here his mathematical ability discovered various interesting laws. For example, he derived an accurate formula showing the distribution by age of applicants for life insurance.

In 1881 he moved to Cambridge and took part in the work of the Harvard Observatory. In 1886 he became a private investigator, or as he called it an "amateur" astronomer. In 1904 he removed to Wellesley Hills, Mass., where he lived until his death. To give any adequate account of his scientific work is impossible in this sketch. It is to be found in more than 200 papers published chiefly in the *Astronomische Nachrichten*, the *Astronomical Journal*, and the *Annals of the Harvard College Observatory*.

His Almacantar, an equal-altitude instrument floating in mercury, gave results of greatest precision, and furnished him with the first intimations of changes in latitude. To the series of masterly papers by Chandler on the variation of latitude, appearing in 1891-1894, Professor H. H. Turner has rendered a magnificent tribute in his book "Astronomical Discovery." No better bird's-eye view can be found of this great discovery, so contrary to the accepted opinions of the astronomical world at that time. Chandler's courage and sound practicality are shown in these words, written in 1893. "It should be said, first, that in beginning these investigations last year, I deliberately put aside all teachings of theory, because it seemed to me high time that the facts should be examined by a purely inductive process; * * * and that the entangled condition of the whole subject required that it should be examined afresh by processes unfettered by any preconceived notions whatever. * * * I am not much dismayed by the argument of conflict with dynamic laws, since all that such a phrase means, must refer merely to the existent state of the theory at any given time."

Facts won against theory. With great industry he skillfully coördinated thousands of observations and proved conclusively that the

changes in latitude occurred according to two superposed oscillations, one of fourteen months, the other of a year. With this key he unlocked many mysteries of the past. His work harmonized the Washington observations for latitude. He "added a hundred feet to Bradley's monument," and showed that Pond's apparent errors attested the excellent quality of his observations. Variation of latitude explained also the difficulties experienced by Airy with his Reflex Zenith Tube.

For these researches he received in 1895 the Watson Gold Medal of the National Academy of Sciences, and in 1896 the Gold Medal of the Royal Astronomical Society. The latter was given also in consideration of Chandler's work on variable stars. These objects were a favorite study of his. Three successive catalogues of variables, prepared by him, may be mentioned.

He was editor of the *Astronomical Journal* from 1896 until, on account of ill-health, he resigned and became associate editor in 1909. Among his numerous activities, Chandler was interested in the transmission of astronomical intelligence by telegraph. He devised the "Chronodeik" for determining the time. He studied cometary orbits, and made computations which led to the discovery, in coöperation with the Harvard Observatory, of the position of the small planet Eros on photographs made at the observatory four years before the planet was known to exist.

Chandler was elected a Fellow of this Academy in 1883. For his Almacantar he was awarded in 1884 the medal of the Massachusetts Charitable Mechanics Association. He received in 1891 from De Pauw University, Indiana, the honorary degree of LL.D. He was a member of the National Academy of Sciences, and a Foreign Associate of the Royal Astronomical Society. He was a member of various other scientific associations. For many years he served efficiently on the Gould Fund Committee of our Academy; also on the Bache Fund Committee of the National Academy.

Dr. Chandler possessed what may seem unusual in a scientific mind, keen business judgment. He was able to gauge the underlying financial conditions accurately, so much so that his advice in such matters carried weight with friends engaged directly in the business world. This was of great service to him in his affairs relating to trusteeship, the duties of which he faithfully and efficiently discharged.

He was very fond of good music of the old school, Beethoven, Gounod, and Verdi being among his favorites. He did not care for the modern composers, and never listened to their work if he could avoid it. A forced hearing of Debussy or Brahms, it is said, was sure to bring forth some humorous but scathing criticism at the finish. His contention was that music was for the pleasure of the senses only, and attempts to make it appeal to the intellect were disastrous. He read almost everything except the modern novel. This he was apt to class as "cheap stuff." Relaxing from his scientific work, he would become absorbed in some other subject, for instance the American Civil War, and read volume after volume about it. In French, Dumas was a favorite author. In such periods of reading Renan's *Life of Christ*, Saint Paul, and the Bible would come in close succession. Tales of adventure, detective stories, history, and biography as related to history appealed to him.

Dr. Chandler was devoted to his family and their interests. Although the family dinner table was a large one and he might be much preoccupied, having been called several times before responding, it is said that he never failed to notice instantly the absence of any member of the family group. He found much satisfaction in restoring his grandfather's homestead at Strafford, Vermont, where he enjoyed the long summer vacations with his family. The writer, who spent a summer some years ago at Strafford, remembers the delightful way Dr. Chandler entered into the community life. His daughters with others had become interested in dramatics, and he took great pleasure in conveying the "band of strolling players" as he called them, over to neighboring villages to give performances.

He was fond of driving, preferring horses to an automobile. "Not to own a machine" he said, "from being a proof of aristocracy had now become a mark of respectability." He enjoyed books on magic and gave sleight of hand exhibitions at Strafford. The "Old City Wizard" was a title bestowed upon him in those days. It was a pastime of his at Strafford to design, make, and sail beautiful little yachts, two or three feet in length. He used to say that he was sailing the exact model of one of the "Cup Defenders" years before she was launched. To a clever local mechanic who assisted him in some parts of the construction, it was a wonder that the models should have the exact displacement predicted by their designer. Such was his life at Strafford.

ford. To live out of doors in the country with his family was an ideal vacation for him.

Dr. Chandler was an entertaining conversationalist, and a delightful companion, an English astronomer remarking that it was worth crossing the Atlantic to visit him. He was cordial and constant in friendship, so unpretentious that many who met him only in later life were unaware that he had any claim to distinction. To those who know his work, "he has left the remembrance not so much of mere talent as of positive genius." The creative power of his intellect combined with courageous and unflagging industry produced a record of notable achievements, linking his name inseparably with the history of astronomy of his time.

EDWARD S. KING.

ELIOT CHANNING CLARKE (1845-1921).

Fellow in Class I, Section 4, 1887.

Mr. Clarke was born in Boston on May 6, 1845, and was the son of the Rev. James Freeman Clarke and Anna H. Clarke. His father was one of the most distinguished Unitarian clergymen of his day, a leader in thought, and the author, among other things, of a book entitled "Ten Great Religions," which occupies a high place in theological literature.

The first ten years of Mr. Clarke's life were passed in Boston and in Meadville, Pa., the home of his mother's family. In 1855 his parents settled at Jamaica Plain. He was educated in the public schools, preparing for college at the Eliot High School, and was graduated from Harvard College in 1867. He was Chief Marshal of his class. He took some special studies at the Massachusetts Institute of Technology in 1867-68, and in February, 1868, he began his career as a civil engineer on the bridge then building over the Mississippi River at Quincy, Illinois. His uncle, Thomas Curtis Clarke, was a noted civil engineer, a member of the firm of Clarke, Reeves & Co., Bridge Builders, of Phoenix, Pa., and in 1896 President of the American Society of Civil Engineers. Mr. Clarke's firm was building the bridge over the Mississippi River and the work offered a good opportunity for the nephew to begin his engineering experience. Later, he was

engaged upon other engineering works, viz., the bridge over the Mississippi River at Hannibal, Mo., and other structures built by the Phoenix Co., the Chicago Water Works Tunnel, and the Chicago Sewerage System.

In the dull times which followed the Panic of 1873, Mr. Clarke returned to Boston to take further special studies at the Institute of Technology in 1875-76. In July of the latter year he was appointed Engineer in charge of a survey for a main drainage system for Boston. The project was adopted and construction was begun in 1877. It was carried through to completion in 1884 under the supervision of Mr. Clarke, who published a description of the work in 1885. At this time he was recognized as one of the leading sanitary engineers of the United States. In 1885 he received the Norman Medal of the American Society of Civil Engineers for his paper entitled "A Record of Tests on Cement Made for the Boston Main Drainage Works." In the work which this paper describes a great deal of cement had been used and Mr. Clarke had made some novel and valuable experiments. Among other things, he was one of the first to prove and to advocate the importance of fine grinding of cement, showing that the coarse grains had very little cementing quality. In 1884 he became Chief Engineer of the Massachusetts Drainage Commission, which was appointed to design methods of preventing pollution of the waters of the Charles, Mystic and Blackstone River basins.

Shortly after this time he gave up his strictly engineering work to become the Manager of mill properties at Lowell, to which his attention was devoted for a number of years. His retirement from engineering was a distinct loss to the profession.

Mr. Clarke was a man of wide interests. He was a Fellow of the American Academy of Arts and Sciences, and its Treasurer for eleven years. He was a member of the Massachusetts Natural History Society, the Massachusetts Horticultural Society, the Colonial Society, and the Corporation of the Massachusetts Institute of Technology. He served also as a trustee of the Massachusetts School for the Feeble Minded, as trustee and vice-president of the Provident Institution for Savings, as director of the State Street Trust Co. and of other companies. He was interested in astronomy and prepared a work on that subject.

Mr. Clarke was married in 1878 to Alice V. Sohier, by whom he had

five children, three of whom survive him. He is also survived by one sister, Miss Lillian Freeman Clarke.

Mr. Clarke was a man of great engineering ability, a clear thinker, an efficient organizer, a good administrator and a most lovable man. Before leaving his chosen profession for business, he had reached a position of preeminence in it, and in his business career he showed the same rare qualities. A host of friends mourned his passing.

GEORGE F. SWAIN.

WILLIAM GILSON FARLOW (1844-1919).

Fellow in Class II, Section 2, 1874.

It is certainly presumptuous for one not a botanist to write about Dr. Farlow, but an intimate friendship of over 50 years makes it possible for me to speak of him as a man, and I hope I have succeeded in presenting an adequate picture of his botanical achievements by constructing a mosaic from the facts and opinions of the four experts, who have written about him already.

By the death of William Gilson Farlow the Academy has lost one of its most distinguished fellows, since it was his rare good fortune to begin his scientific work, when a great body of material had been collected by such pioneers as Curtis in fungi, Harvey in algae, Tuckerman in lichens, Sullivant in mosses and many others, and the science in this country had reached the point where it needed some man with breadth and grasp enough to draw all these scattered parts into a connected whole. In Farlow it found the genius, enthusiasm and character needed for this great work and the training, which developed and supplemented these natural gifts. He occupies, therefore, the same commanding position in cryptogamic botany that Asa Gray holds in the development of our knowledge of flowering plants.

He was born in Boston December 17, 1844, the son of John Smith Farlow, a prosperous public-spirited citizen and Nancy Wight (Blanchard) Farlow, both of Massachusetts parentage. From his father he inherited strong tastes for botany and music. In fact, John K. Paine, then recently established in Cambridge, urged him to become a professional musician, but the call of botany was too strong and music sank into a delightful recreation after his exacting scientific work.

He was educated at the Quincy Grammar School and English High School in Boston, followed by a year at the Boston Latin School, which

with his training in Harvard College made him a sound classical scholar. In after years he was fully alive to the greater breadth of view and roundness of intellect given him by this training in the humanities, as well as to the value of his Latin and Greek in giving him a mastery of the force of scientific terms and names.

It is said that his attention was first drawn to botany when a boy by finding hepaticas in the woods near his father's place in Newton. However this may be, he made such rapid progress in the science that by his senior year we lower classmates spoke of him with bated breath as a prodigy of botanical learning.

This progress was largely due to the fact that in college he encountered the first of his two great teachers — Asa Gray, who gave him a solid foundation for his later professional studies; but instead of embarking on these at once after his graduation in 1866, following the advice of Asa Gray, he took up the study of medicine, and after studying anatomy for a year under Jeffries Wyman — a man whose casual talk was a liberal education, he entered the Harvard Medical School in November, 1867, and graduated from it in 1870, securing before his graduation the coveted appointment of surgical interne at the Massachusetts General Hospital under that great surgeon, Henry J. Bigelow; so that he took up his higher botanical studies with a much more rounded general education than falls to the lot of most scientific men, the effect of which could be traced throughout his life in his unusual sanity and breadth of view.

In 1870 he began his special botanical education by serving for two years as assistant to Asa Gray, whose inspiring teaching gave him a comprehensive knowledge of flowering plants and made him thoroughly familiar with the systematic outlook on the science, while his example helped to make him a botanist in the broadest sense of the word, instead of a mere specialist on the cryptogamic side.

Even at this early day he had selected his line of work — the cryptogams — and began to study the algae in the herbarium at Cambridge and also in the field at Woods Hole, where in 1871 he joined a scientific party under S. F. Baird, publishing in this year his first paper "Cuban Seaweeds."

At that time there were no facilities in America for studying cryptogams, so again following the advice of Asa Gray, he decided in 1872 to go to Europe, where he spent the better part of two years in study

at Strassburg under Anton De Bary, then the first authority on fungi in the world. He was very fortunate in working under two such men as De Bary and Asa Gray, each a master in his own field, and these lay so far apart, not only in matter, but in methods of treatment, that he gained from them a remarkably broad and comprehensive grasp of the science.

It was indeed a new botanical atmosphere into which he was plunged at Strassburg. Systematic botanists were spoken of scornfully as "hay collectors," and with the zeal of new converts most German botanists prided themselves on their ignorance of flowering plants. De Bary himself was not free from this sort of narrowness, but Asa Gray had impressed the importance of systematic work and flowering plants so thoroughly on Farlow, that he did not allow himself to be swept off his feet even by the flood of new ideas with which he was continually deluged by De Bary and the eminent students he had drawn about him, such as Graf Solms and Rostafinsky.

When I heard Farlow talk with De Bary in the Strassburg laboratory I heard two naturalists discussing the question on equal terms, except for the greater knowledge and experience of the older man — a very striking contrast to the state of almost abject pupilage, in which we chemical students were kept by our German professors. The difference lay, of course, in the students, not in the professors.

During his stay with De Bary he grew familiar with the whole field of work in the morphology and development of fungi and in plant anatomy, and toward the end of the time published a paper on "An Asexual Growth from the Prothallus of *Pteris cretica*," which was attacked so heartily that he returned to America with his reputation made.

Although the larger part of his time in Europe was spent with De Bary, he gave shorter periods of study to lichens under J. Mueller at Geneva, and to algae with Bornet and Thuret at Antibes, and travelled extensively, visiting most of the celebrated botanists and herbaria.

These years of study in Europe brought his education to an end and made him, so far as is known, the only American cryptogamic botanist capable at that time of doing original work himself and of teaching it to advanced students. More than this, they put the finishing touch to the cultivation of the qualities that made him great — his strong and piercing intelligence, his phenomenal memory, the discriminating

judgment and devotion to truth that made him refuse to accept conclusions, until they were absolutely established, and the unusual breadth of view so often mentioned already. To these must be added an insatiable love of work, as well as great and constantly increasing stores of learning.

As soon as he reached America his appointment as Assistant Professor of Botany in Harvard University put him in a position to make the most of these treasures and to raise cryptogamic botany in the United States from a mere sketchy appendix in a general course of botany to the rank of an independent study.

For five years he was stationed at the Bussey Institution of Harvard University, although his teaching was in the college, and then in 1879 he was transferred to Cambridge as Professor of Cryptogamic Botany.

These five years at the Bussey Institution, however, had an important influence on his life as well as on the botanical development of the country, since they called his attention to the fungous diseases of plants, and he threw himself into work in this virgin field with such energy that he is acknowledged as one of the founders of phytopathology in the United States — a study which has since reached such proportions that we lead the world in it at present.

His papers in this field are numerous and important. Among them may be mentioned studies of potato rot, grape mildew, black knot, onion smut, gymnosporangia, fungous diseases of hollyhocks, roses, and even of salted codfish.

After he was settled in Cambridge, his plans included the establishment of a herbarium and a library of cryptogamic botany, in addition to the teaching and research properly belonging to his professorship.

The first step towards his herbarium had been taken even before his return from Strassburg, as then Asa Gray bought for him the famous collection of fungi made by the Rev. M. A. Curtis. To this nucleus were added later many other famous collections, which had been either bequeathed to the University, or purchased by him. Conspicuous among them were Tuckerman's lichens, Sullivant's, James's, and Kennedy's mosses and hepatics, Faxon's sphagna, and, quite as important as these, his own rich collections of fungi and algae. His father's wealth enabled him also to make his library — like his herbarium — the fullest and best in the country and both were always open to botanists qualified to use them.

As a lecturer he was peculiarly happy, for to the authority of a master he added a clear style, the faculty of bringing essential points into strong relief, and a humorous quality, which riveted the attention of his hearers; but even more important than his lectures was his work with students in research. Here his inspiring personal teaching — for he never left them to an assistant — developed many distinguished students, among them such masters as Roland Thaxter, William Trelease, W. A. Setchell, Kingo Miyabe, and Herbert M. Richards.

His scientific papers average three a year for the whole forty-five years of his active work, if the papers of his students are included, as they should be. They have been characterized as "clear, concise and accurate," the well-considered careful utterances of a master, who never yielded to the temptation of rushing into print, and also was chary of establishing new species out of the great wealth of material at his disposal, since he had a profound contempt for bad species, as shown by his caustic remark about the manufacturers of them.

"If a difference can be *imagined*, it is a new species; if it can be seen, it is a new genus."

Nearly two-thirds of his papers have to do with fungi, including the studies of plant diseases already mentioned; while somewhat less than one-third deal with algae, many of these with the contamination of water supplies by them. One published in 1879 was reprinted 38 years later by Professor Whipple as "one of the classics of state sanitation." It is written in a popular style, as are several of his papers on fungi.

Other useful papers consist of reports on the cryptogams collected by various exploring expeditions and of lists of cryptogams found in special localities. For example, a list of the seaweeds of the New England coast, (published in 1881) "included keys, descriptions, critical notes and plates," and according to Professor Riddle "still remains our only scientific manual of the seaweeds of this region."

Quite as important as this was the "Provisional Host Index of the Fungi of the United States" published in 1888 and 1890 with Mr. A. B. Seymour, which has proved of the greatest use to working botanists.

Of his bibliographical papers the most important was a "Bibliographic Index to North America Fungi," of which the Introduction and the first 312 pages, prepared in collaboration with Mr. A. B.

Seymour, were published by the Carnegie Institution in 1905 and although the publication has not been continued, the collection of data went on until his death. This was perhaps his greatest work, and some idea of its magnitude can be obtained from the facts that at the time of his death the Index included about 350,000 references, and the 312 pages published in 1905 brought the alphabetical list of that day only through *Badhamia*. As the work is essentially finished, it is hoped that it may soon be published since it will be of untold value to specialists.

Another great work left unfinished at his death is an account of selected species of American fleshy fungi, which was to be illustrated with over 100 colored plates. These have been executed under his direction with the utmost care, but although the plates were finished, the pressure of his other botanical undertakings prevented him from even beginning the descriptions of the species. It would be well, if these descriptions could be supplied by another hand, so that what promises to be a classical work may see the light.

In discussions of nomenclature he threw his powerful influence in favor of sane and stable methods for naming fungi, thus helping to check the extreme radicalism of many American botanists, and preserving relations with the better men abroad.

But his papers alone — important as they are — did not make him "the creator of cryptogamic botany in the United States." It was the man himself — his personality, his breadth, his wise conservative judgment, his learning, his helpfulness, and his devotion to truth.

American botanists were brought in contact with this commanding influence by means of his papers and his students and even more effectively by his direct personal intercourse with them, for he was always ready to give them generous help, and they were more than ready to make use of it, submitting their puzzles to his excellent judgment, reinforced as it was by a reading that covered the whole literature of the cryptogams, not in abstracts, but in the original sources; borrowing specimens from his herbarium for comparison; asking him to look up references in journals hard to find outside his library; or even sending him specimens to determine. Some idea of the volume of this work is given by the fact that a single correspondent confesses to 100 letters in his own handwriting.

His achievements earned wide recognition. Two genera were

named after him, *Farlowia* among the algae, and *Farlowiella* among the fungi, beside a great number of species. Harvard, Wisconsin and Glasgow conferred the degree of LL.D. upon him, and Upsala on the two hundredth anniversary of the birth of Linnaeus, at which he represented our Academy, crowned him with laurel as one of its Doctors of Philosophy.

He was elected a fellow of our Academy in 1874, and was also a member of the National Academy of Sciences, the Philosophical Society, the Linnaean Society and the French Academy of Sciences. He served as president of the New England Botanical Club, of which he was one of the founders, of the American Association for the Advancement of Science; of the American Society of Naturalists, and of the Botanical Society of America.

There is little more to be said about his life, which was passed in Cambridge during term time, with the exception of a few journeys to Europe and botanical excursions on this continent, the most important being one to Mexico and California with Asa Gray in 1885. Most of his work in the field, however, was done in the White Mountains, where his vacations were usually passed. A walk in the woods with him introduced one to a new world largely microscopic, but full of interest and even beauty.

In 1900 his marriage to Miss Lilian Horsford made his life one of complete happiness until his death on June 3, 1919.

Farlow's most striking characteristic — apart from those I have already pictured in connection with his scientific work — was the humor which permeated and irradiated all he said, making even his common talk amusing and delightful, but this humor is so elusive that it evaporates between the pen and paper, so that I can refer to no example of it. On the other hand, his wit often flashes out in all but his most serious papers.

His hatred of affectation, sham and superficiality was intense, and his outspoken denunciation of them, driven home by his incisive humor, made so deep an impression that many, who knew him mostly by hearsay, thought him a sarcastic pessimist, but his friends saw that his attacks were directed only against those who deserved them, and knew that the real nature of the man was affectionate and kindly, making him the most staunch and faithful of friends, and the sympathetic helper even of those who had no claim on him whatever.

It is pleasant to think of his declining years when full of well-earned honor, happy in his troops of friends, happier in his family with his mind undimmed by any weakening of his faculties, he was able to continue in active work until the brief sickness, which brought the end.

CHARLES LORING JACKSON.

JULIUS VON HANN (1839-1921).

Foreign Honorary Member, Class II, Section 1, 1902.

Nearly half a century ago Julius von Hann began to take his place as the universally acknowledged leader of meteorological science, and for many years previous to his death he stood out head and shoulders above his fellow-workers. He grew up with and himself was, as it were, a large part of the rapid modern development of meteorological science. He was able, through his intense application and industry, and because of his great intellectual powers, not only himself to contribute largely to the advance of his science but also to keep closely in touch with all the work which was being done by investigators and writers everywhere. For years his many contributions to the *Meteorologische Zeitschrift*, often modestly signed J. H., were never-failing evidence of his truly extraordinary grasp of his subject and of the universal range of his reading. He was, as fully as any one human being can be, a living encyclopedia of his chosen science. And this is in no sense to be taken as suggesting that his mind was merely a storehouse of dry, hard facts. He was very human. He saw the many and varied relations of meteorology and climatology to human life and activities, and he was always on the lookout for opportunity to emphasize these relations. His writings were always clear, vivid, and interesting. His "Handbuch der Klimatologie," for example, which inevitably has to deal largely with "dry" statistical details, is enlivened throughout by carefully selected, vivid, first-hand descriptions of weather types and of human or botanical responses to the climatic environment.

His fellow-workers who remain are dynamic or physical meteorologists, or climatologists, or are specializing in this or that subdivision of their science. This is a natural and inevitable situation at the present

stage of our knowledge of the atmosphere. It cannot well be otherwise. But it leaves a great gap which no one man can ever fill, because meteorology has now grown to such an extent that specialization is the rule, and no single mind will ever again master all of its details. Hann's "Lehrbuch der Meteorologie" is the one absolutely indispensable textbook in that science. Upon his "Handbuch der Klimatologie" all studies of climatology must, for years to come, be based. This extraordinary grasp of the whole wide range of his science he maintained practically till the day of his death.

Somehow, when a man like this passes away, a bare statement of the essential facts of his life and a list of his contributions to science seems unnecessary and futile. Yet there is something singularly significant in the fact that this man, living a very simple life, with very few changes of residence, extended his interests and his reading to all parts of the world. He knew the geographical and climatological conditions of almost every corner of the globe as intimately as if he had himself lived there. Hann — for thus, and not as von Hann, he will oftenest be recalled — was born March 23, 1839, near Liuz, in Austria. He began his professional life as a school-teacher. At the age of twenty-nine he entered the Central-Anstalt für Meteorologie in Vienna. From 1874 to 1897 he was its Director, an office from which he retired at the age of fifty-eight. For many years he was a professor at the University of Vienna, first of Physical Geography and later of Physics. His work for meteorology did not cease when he ceased to be Director. He went to Graz as Professor at the University, and there, in the Physical Institute, he wrote his "Lehrbuch der Meteorologie," whose three editions bear the dates 1901, 1906, 1915. A fourth edition, supervised by Süring, is now in course of preparation. In 1900, Hann returned to Vienna as Professor of Cosmical Physics, a position which he held until his retirement in 1910. The "Handbuch der Klimatologie" he wrote while in Vienna. The three editions of this book bear the dates 1883, 1897, 1908-1911. These two books are Hann's monumental publications. It is almost literally true that no student of meteorological science can do a day's work without referring to them. Throughout his long editorship and joint editorship of the *Meteorologische Zeitschrift* (1866-1920) he steadily contributed to the pages of that journal a series of articles and notes which are invaluable, for in these he revised, summarized, commented upon, and put into

permanent form a vast body of meteorological and climatological material. In 1906, in commemoration of forty years of his editorship, a special *Hann Band* of the *Zeitschrift* was issued. Two other major publications are the *Atlas der Meteorologie*, forming Part III of the *Berghaus Physikalischer Atlas* (1887) which was for years the standard meteorological atlas of the world, and *Die Erde als Gauzes; ihre Atmosphäre und Hydrosphäre* (1st edition, 1872; 3d edition 1880; 5th edition 1896).

Hann was the recipient of many honors, and was made a member of many learned societies, both in Europe and abroad. He was the first foreigner to receive the Symon's Gold Medal of the Royal Meteorological Society (1904).

Hann died in Vienna, October 1, 1921, in his eighty-third year. No more fitting tribute could possibly be written of him than that contained in the notice of his death sent out by his former colleagues in Vienna. "Ein Leben ununterbrochener Geistesarbeit und reinster Forschung im Dienste der Wissenschaft ist abgeschlossen. Aber ungezählte Fäden führen von Hann's Werken in alle Länder der Erde und wirken in seinem Sinne fort."

R. DEC. WARD.

HENRY LEE HIGGINSON (1834-1919).

Fellow in Class III, Section 4, 1912.

The "Life and Letters of Henry Lee Higginson," by Professor Bliss Perry, published in the autumn of 1921, affords so full and accessible a record of the career and character of this Fellow of the Academy that anything beyond a brief summary would be superfluous for the present purpose.

Two conspicuous anomalies in the life of so eminent a citizen of Boston and son of Harvard were that he was born in New York (November 18, 1834) and that he was a member of Harvard College for only a few months in the freshman year of his class of 1855. He was, however, of pure New England descent, and when he was in his fourth year his family left New York and provided him with that Boston background which he was to adorn for more than eighty years. The brevity of his connection with Harvard, for which he was prepared

at the Boston Latin School, was due to a weakness of his eyes. Of the ten years between his leaving college and the outbreak of the Civil War, more than five were spent in two visits to Europe, and a year and a half, in the interval between them, as a clerk in the counting house of S. & E. Austin, Boston merchants. The second of his European visits, from 1856 to 1860, was devoted largely to the study of music, pursued to the extent of physical injury, and also to the end of reaching the reluctant decision that his talents would not justify his becoming a professional musician. It was then, however, that he determined, if he could ever compass it, to enrich the lives of his countrymen with music as his own life had been enriched by the music of Vienna and other European cities.

The disappointed student returned to America only a few months before the outbreak of the War of Secession. His immediate future could not long remain uncertain. As an officer, first of the Second Massachusetts Infantry and then of the First Massachusetts Cavalry, he proved himself an admirable soldier. Serious wounds received in June, 1863, incapacitated him for much of the second half of the war. In December, 1863, he married Ida Agassiz, daughter of Louis Agassiz.

In the years immediately following the war he sought his fortune, in company with his young wife, through oil in Ohio and cotton in Georgia, but without success. In 1868 he joined the Boston banking and brokerage firm of Lee, Higginson & Co., with which he was conspicuously identified for the remaining fifty-one years of life.

By 1881 his labors and good fortune enabled him to realize the dream of his young manhood through establishing the Boston Symphony Orchestra. This he maintained, at a very large personal cost, for thirty-seven years. The fortune which he spent upon it was the measure of his devotion to his city, his country, and his kind. But it was not expressed through this interest only, for his gifts to Harvard College, through a long period of years, gifts devoted primarily to the happiness and health of the student body, placed him among the great benefactors of that institution. To friends and others in need he was constantly holding out a helping hand. Though his name is most associated with the art of music and with education, he gladly furthered many another good cause, local and national. He was withal a strongly individual figure, outspoken in praise and blame, much swayed by his affections, endowed with many of the most lovable

human qualities. By his death on November 14, 1919, in Boston, his community lost its foremost figure, and his country a pattern of the highest patriotism.

M. A. DEWOLFE HOWE.

FRANKLIN PAINE MALL (1862-1917).

Fellow in Class II, Section 3, 1901.

Franklin Paine Mall, 1862-1917, was born in Iowa of German extraction, his father being one of the 1848 immigrants. Nothing is known of his boyhood education, which was mainly in a boarding school near his home. He studied medicine in the University of Michigan, and received the M.D. degree in 1883, before attaining his majority. He then went to Germany and spent several years in study at Heidelberg and Leipzig, at the latter place in the laboratories of Ludwig and His, these being men of the highest rank in science and who exerted a great influence on his life. From 1886 to 1889 he was Fellow and Instructor in Pathology at the Johns Hopkins University under Professor Wm. H. Welch, from 1889 to 1892 Adjunct Professor of Vertebrate Anatomy at Clark University, and from 1892 to 1893 Professor of Anatomy at the University of Chicago. He returned to Baltimore in 1893 as Professor of Anatomy in the newly formed Johns Hopkins Medical School, which position he held to his death, being also the Director of the Carnegie Institute of Embryology which was established at the Johns Hopkins Medical School in 1912.

Such are the brief facts concerning the official career of the man who, in the great renaissance of medicine during the last fifty years probably did more in America than any other man to make possible this rebirth and growth. He was a great teacher, as such bringing to medical teaching the ideal that knowledge is to be sought not in lectures or books but by the study of nature, the student acquiring primary knowledge by independent work which might be extended by reading and at the same time receiving training in scientific methods which would increase individual power. This method at the time of its induction was novel, was resisted by both students and faculty, but was steadily carried out in his laboratory, and has become the accepted method of the best teachers.

He was a great scientific investigator. As such his work was thorough, he touched no subject on which his investigations did not throw light and in most cases he left the subject standing clearly, the obscurities gone. He was a leader, not a follower, his researches were carefully planned, he used all methods of approach, and was fertile in devising new methods of work. His individual contributions, of which there are more than a hundred, and the five hundred contributions from his laboratory, rank with highest contributions to the science of anatomy.

He was active in the promotion of opportunities for the advance of medical science in all places, his advice was always sought and valued, and his influence has been very great in the advance of medical teaching in this country and elsewhere. He led a simple and quiet life, was a good citizen, a good friend.

For account of his life and work see Johns Hopkins Hospital Bulletin, Memorial Service held May, 1918; Anatomical Record, January, 1918.

W. T. COUNCILMAN.

SIR WILLIAM OSLER (1849-1919).

Fellow in Class II, Section 4, 1897.

In 1849 William Osler was born in Tecumseh, Ontario, Canada, the son of Reverend F. L. Osler. Beginning his medical training at the University of Toronto, he continued it at McGill whence he received his M.D. degree in 1872. Two years were spent in study abroad at London, Berlin and Vienna. Returning to Montreal in 1874 he was made Lecturer on the Institutes of Medicine at McGill, and shortly afterwards was given the Professorship. This began what continued to be, for him, the chief interest of his life, for Osler, more than anything else, was a teacher, first at McGill, later at the University of Pennsylvania, then at Johns Hopkins, where he exerted his greatest influence as an inspiring leader of an increasingly large group of students, and finally at Oxford, where, as Regius Professor of Medicine, he held a unique position of influence on both American and British medicine.

In the early days of his medical career Osler was a diligent student of pathology and contributed important studies in this field, notably on

blood platelets. Chiefly, however, in this period he was laying a foundation for his future clinical work in a thorough and extensive knowledge of pathological anatomy gained from making post mortem dissections with the enthusiasm of a keen minded, enthusiastic, indefatigable worker. This interest in pathological anatomy he never lost and his knowledge of it proved an ever ready help in his subsequent career as a clinician, teaching the principles of the practice of medicine in the wards of the various hospitals where he served.

At the Johns Hopkins Hospital he inaugurated what was to prove, perhaps, the most important contribution to methods of teaching medicine of the half century in the latter days of which we now live, namely, the learning of medicine by laboratory practice rather than by lecture and recitation, for he made of the hospital wards the laboratory of clinical medicine in which the same observational methods were pursued as in the laboratories of natural science and the facts of pathological anatomy and physiology were correlated with the phenomena of disease as seen in the individual patients. Into this laboratory method he brought the humanizing and inspiring influence of a personality keenly interested in helping and stimulating his fellows and one by nature endowed with a winsomeness, charitableness and humor that made of him for students and patients a lifelong friend. Though a laboratory, yet the wards were always clearly recognized as the place in which each individual patient must receive the best possible professional care and the kindly considerate aid that is due to a fellow-man in distress. Though laboratory director, Osler in his wards was ever the true physician.

In all of his very numerous contributions to medical science and practice as well as in his textbook of medicine, Osler shows a very distinctive and delightful literary style. He is direct, simple and logical. Examples that illustrate and clarify are chosen with great discretion. In his addresses quotations evince both his knowledge of the best in literature and his ability to emphasize or impress his point by apt quotation. Always greatly interested in the historical background of medicine, he makes much use of historical reference in his writings. There is ever the quaint turn of his humor or some epigrammatic line to enliven the description or discussion. His words are chosen with great charm of diction and still it is rare that his meaning is at all ambiguous. In almost all of his writing there is a personal element

that, for those who knew him, recalls vividly to memory the picture of the man and his personality. His publications were numerous and varied, for the most part dealing with clinical medicine. A bibliography published in 1919 shows 730 titles. His practice of medicine has remained, since the first edition in 1892, the most popular textbook for English speaking students as well as having been translated into French, Spanish and Chinese. A new edition has been issued at three year intervals and through this book Osler exerted a tremendous influence on the practice of medicine for in it Osler's personality dominates in a truly remarkable way when one considers the difficulty of introducing any personal note inherent in a textbook necessarily condensed when covering such a voluminous topic as the practice of medicine.

Through all the years of his activities as investigator, teacher, medical writer and hospital chief, Osler remained an active consultant, aiding fellow physicians in the solution of difficult problems in diagnosis. His own optimism radiated courage to the patients and his delightful personality and charm endeared him to innumerable physicians who brought him patients. He was most intolerant of unkind criticism of others and would never allow patients or physicians to bring to his ears unsavory gossip of fellow practitioners. He believed in and practiced direct honesty in dealing with patients and physicians, but a different opinion or advice from him never carried with it the sting of a rebuke nor the implication than an unjustifiable error had been made by another.

Osler was distinctly more a scholar than almost any of his medical contemporaries. He had a deep interest in the classics. That he, a physician, should be president of the British Classical Association, as he was in 1919, was a recognition by scholars of his classical learning. His interest in medical history has already been referred to. In this connection he was, all of his life, an ardent bibliophile and his library of early editions of medical classics and allied topics was a veritable treasure house. To many his name recalls the picture of a delightful eagerness and radiant charm of manner as, standing in his library either earlier in Baltimore or later in Oxford, with one of his choice volumes in hand, he turns the pages and talks of the author or his writings. This is the mental picture rather than that of physician, for, however much his life's work was that of inspiring medical men, he

seemed peculiarly in his proper setting by his beloved books. He took a great interest in both the Bodleian Library at Oxford and in the Oxford Press, and to both he gave much thought and time, serving each in official capacity.

When Osler left Baltimore for Oxford he was almost universally conceded to be the leading man in American medicine. At Oxford he merely widened his sphere so as to become the leader for British as well as American medicine. He died Dec. 29, 1919 of complications following pneumonia. The death of his only son in the World's War and the strain incident to his own activities in connection with the problems of the sick and wounded were important contributing factors. In his lifetime he moulded in many very important ways medical thought and medical teaching. He was greatly beloved by students, fellow practitioners and patients by reason of his human friendliness and his kindliness. To his students and medical colleagues he was ever an inspiring leader stimulating to diligence in medical work and exemplifying in himself what the ideal physician and medical teacher and writer should be.

HENRY A. CHRISTIAN.

WILHELM PFEFFER (1845-1920).

Foreign Honorary Member in Class II, Section 2, 1897.

The death of Professor Wilhelm Pfeffer, on the 30th of January, 1920, removed one of the outstanding figures of the scientific world. With the exception of Strasburger, he probably influenced the work of the last generation of American botanists more deeply than any other man.

The last two decades of the nineteenth century was a period of remarkable development of botany in America. A number of factors contributed to this, but undoubtedly the most important was the influence of the work of the great German botanists of the previous twenty years. Through the translation of Sachs's famous text-book and several other important German works American botanists were introduced to the results of the investigations of the morphologists and physiologists, who made Germany at that period the leader in botanical science. Up to this time, one may almost say that physiology and comparative anatomy in botany, did not exist in America. As a

result of this newly aroused interest, many of the younger botanists looked forward to studying in Germany.

It is true that a small number had found their way abroad in the seventies, but it was not until a decade later that the real exodus to the German laboratories began. For ten years or more there were always to be found American students in the principal botanical laboratories of Germany, especially in Strasburger's laboratory in Bonn and in Pfeffer's at Leipzig. These young Americans applied themselves to the acquirement of the latest methods of research, particularly in the field of histology and cytology with Strasburger, and physiology under Pfeffer's direction. It is hardly necessary to point out the results of this training on the subsequent development of botanical teaching and research in America.

Pfeffer was almost the last of that remarkable band of distinguished investigators who for nearly half a century made Germany the center of botanical progress in Europe.

The writer spent the summer semester of 1887 in Pfeffer's laboratory in Tübingen, just before he removed to Leipzig where the rest of his life was spent.

The old Suabian town of Tübingen is most picturesquely placed in the beautiful Neckar Valley, south of Stuttgart, and near the northern border of the Black Forest. This region is one of the most attractive in Germany, and the quaint old town, and the amiable South German people, who still clung to their picturesque customs and peasant costumes, made it a most satisfactory abiding place — aside from the scientific advantages of the University.

The laboratory was at this time one of the best equipped in Germany. It boasted a line of distinguished botanists as directors, two of whom, Von Mohl and Hofmeister, were worthy predecessors of Pfeffer. Under Pfeffer's able direction the facilities for work in physiology were probably at that time unequalled.

Sachs, at this period had practically ceased active work and Pfeffer was generally recognized as his legitimate successor.

Pfeffer was an indefatigable worker but found time to supervise carefully the work of his students and to give them the benefit of his valuable criticism and assistance. At this time he was but forty-two years old but looked older, his tall, thin and somewhat bent figure and strongly marked features making him seem older than his years.

Pfeffer was born, the son of an apothecary, in the village of Grebenstein near Cassel, March 9, 1845. He studied at Göttingen where he took his doctorate in 1865, in Marburg, where he afterward taught as docent, in Berlin and Würzburg, in the latter University working under Sachs.

In 1873 he was appointed professor extraordinarius in Bonn, and four years later went as full professor to Basel, where he remained only a year, after which he went to Tübingen. He held the position in Tübingen until his final removal in 1887 to Leipzig where he remained until his death in 1920.

In Leipzig he developed the great laboratory which for more than thirty years was the Mecca for students of plant physiology from all parts of the world. Throughout his long career in Leipzig he was generally recognized as the first physiologist of his generation.

While Pfeffer's name is primarily associated with strictly physiological problems, as a young man he published several morphological papers of considerable importance. Especially valuable was a paper on the development of the gametophyte and embryo of *Selaginella*, a paper that for a long time was the most important contribution to the subject.

It is, however, upon the very numerous and important contributions to plant physiology that his fame rests. These cover an extensive range of subjects, some of fundamental importance, not only biologically, but to physics and chemistry as well. His remarkable investigations in osmotic pressure have strongly influenced the work of subsequent workers in pure physics and chemistry, and their great importance has been fully recognized by these investigators. Pfeffer's extensive studies on plasma membranes and the phenomena of irritability include many papers of the first importance. During his stay in Tübingen he inaugurated a series of publications "*Untersuchungen aus dem botanischen Institut zu Tübingen*" modelled on the similar publication issued from the botanical Institute in Würzburg under the direction of Sachs. This publication ceased on Pfeffer's departure from Tübingen.

Pfeffer's best known work is his great text-book, *Handbuch der Pflanzenphysiologie*. This was translated into English and was for many years the standard work on the subject.

Pfeffer's name is also associated with the well-known periodical,

Pringsheims *Jahrbücher für wissenschaftlicher Botanik*. After the death of Pringsheim, this was issued for several years under the joint editorship of Pfeffer and his distinguished colleague, Strasburger.

Shortly before the outbreak of the war Pfeffer's old students were invited to contribute to a "Festschrift" to celebrate the fiftieth anniversary of his doctorate and his seventieth birthday. The volume appeared in 1915, but the circumstances of the war resulted in the absence of many names which under normal conditions would certainly have appeared in it.

Pfeffer survived the horrors of the Great War, in which he lost his only son, and saw the collapse of the great German empire, in whose upbuilding he and his scientific colleagues played such an important rôle. He had the satisfaction, however, of knowing that their work would survive the downfall of the imperial government and that his name will always rank high in the annals of science.

DOUGLAS HOUGHTON CAMPBELL.

EDWARD CHARLES PICKERING (1846-1919).

Fellow in Class I, Section 1, 1867.

In the death of Edward Charles Pickering after a service of forty-two years as Director of the Harvard College Observatory, the American Academy loses an interested and important Fellow and the Science of Astronomy one who was at his death the dean of astronomical research in America.

He was born in Boston, Massachusetts, July 19, 1846, of a distinguished and highly cultivated New England family. In 1865, he graduated from the Lawrence Scientific School with the degree of S.B. He was immediately thereupon appointed instructor in mathematics in that institution, but the following year he became assistant instructor in Physics in the Massachusetts Institute of Technology, and two years after was made Thayer Professor of Physics.

From the very outset of his teaching his peculiar bent of mind was revealed and the work of research and organization which constituted his great contribution to modern science was begun.

He planned and put into practical shape for use in systematic class instruction the experimental laboratory method in the teaching of

Physics which did much to make the Institute of Technology famous and has since been accepted and adopted universally as an indispensable method of instruction in that subject. To the laboratory which he had organized and built up the Corporation of the Institute in 1872 at his suggestion gave the name Rogers Laboratory of Physics and the additional title of Director of the Laboratory was conferred upon him.

In the autumn of 1876 he was called to become the Director of the Harvard College Observatory, and accepting this invitation he entered upon the duties of the position in February, 1877. His selection by President Eliot seemed at the time a radical innovation for Professor Pickering was a physicist rather than an astronomer of the old school. However, the appointment was justified for it presaged the trend of the New Astronomy along the lines of Physics, a development in which Professor Pickering has borne a most honorable part.

As Director of the Observatory he showed great administrative ability and secured a large financial support for his projects, the endowment growing from a few hundred thousand to a million dollars.

Instead of venturing into the realm of speculative and picturesque astronomy, he was content to be what he called himself "a collector of astronomical facts," the interpretation of which he was perfectly willing to leave to the future. The posthumous value of the work of such men as Herschel and Argelander appealed especially to him and shaped the large investigations that he undertook, whose importance could not be completely revealed perhaps for centuries.

Immediately upon his appointment to his new position, Professor Pickering chose as his particular field of labor the photometry of the stars. Soon after the introduction of the dry plate, in general photography, he was led to investigate its applicability to the study of the stars and their spectra in which work he was a pioneer. He also realized the great value of the objective prism in stellar spectroscopy and made constant use of it in his studies of stellar spectra.

The Observatory under Professor Pickering has made its largest contribution to astronomy in four fields.

(1) Photometry. With the aid of the meridian photometer invented by him, he devised a scale of photometric magnitudes, determining these for eighty thousand stars upon a basis of more than two million observations.

(2) A scale of photographic magnitudes. It was shown later that these are convertible into visual magnitudes through reference to the spectral types of the stars.

(3) A system of classification of variable stars. Light curves have been determined for a large number of these and many thousand measures of their brightness have been made on a uniform scale for all of the sky.

(4) A system of classification of stellar spectra which has been universally adopted. The new Henry Draper Catalogue contains estimates based on this system of all stars to approximately the ninth magnitude, about 200,000 in number.

Through the establishment of an observatory at Arequipa in 1891 after two years of preliminary study it became possible to include measurements made on the stars throughout the southern heavens within the scope of the work of the Harvard College Observatory.

At a later date, 1911, an observing station was established at Mandeville, Jamaica, which has been devoted particularly to the study of the moon and the planets.

In this short article it is not possible to go into detail or even to mention the great variety of investigations carried on to a successful completion. The volumes of the Harvard Annals, more than eighty of which were published during Professor Pickering's directorship, can alone give any idea of this.

A word, however, should be said of the "photographic library" which now contains over a quarter of a million photographic plates that together weigh one hundred and twenty tons. Through the use of short focus lenses and automatic following apparatus there has been kept a "sky patrol" the results of which furnish the history of all the stars down to the tenth magnitude and measuring back for many years. By its use whenever any noteworthy stellar change is discovered the plates will reveal its past history and character, while otherwise one might have to wait years to understand the nature of the phenomena.

Through the use of this library, it is possible to find the history of the stars, as one turns back the pages of a book already printed. What may still be hoped for from this crystallized past of the heavens is shown by what it has already done in recording the extraordinarily favorable position for observation of the minor planet Eros at its

opposition in 1893, though it was not actually known even to exist until several years later in 1898.

Professor Pickering strongly believed in associative work. To him is due the organization of the American Astronomical Society in 1898 (originally called the Astronomical and Astrophysical Society) which now has a membership of over three hundred from all parts of the country, and has been of great service in stimulating research and promoting acquaintance among astronomers. The American Association of Variable Star Observers, a body composed chiefly of amateur observers of these objects, also originated with him.

Professor Pickering was elected a Fellow of the Academy in 1867 at the age of twenty-one years and is said to have been the youngest member ever chosen. He was averse to holding office, probably because during many years regularity of attendance at the meetings of the Academy would have interfered with his professional duties. He was a member of the Council from 1878 to 1884 and a member of the Committee on the Library from 1877 to 1883. He rendered great service to the Academy and to scientific research through his unprecedentedly long and devoted work as a Member of the Rumford Committee. This began in 1869 and continued up to the time of his death with a break, however, from 1890 to 1892, during which interval he was awarded the Rumford Premium "for his work on the photometry of the stars and upon stellar spectra." He contributed to the *Proceedings* twenty-six papers, three of them in collaboration with others. There will shortly be published by the Academy a memoir containing the results of researches upon the photometry of faint stars, carried on at various observatories with the use of a form of photometer devised by him for this especial service.

In 1874, Professor Pickering married Miss Lizzie Wadsworth Sparks, a daughter of the Reverend Jared Sparks, the historian, and a former President of Harvard University. Mrs. Pickering died in 1906.

To those who had the privilege of a personal acquaintance with Professor Pickering his great mind will always seem secondary to his greater heart, his generous friendship and his social charms.

He was never a narrow specialist interested only in his own branch of science. All astronomy, indeed all science, received his interest and encouragement. His broad sympathy included such dissimilar interests as mountain-climbing and music. He was the founder of

the Appalachian Mountain Club and its first President. Music was an inspiration to him in his work, not as a relaxation alone, but as a stimulant which helped him to solve mathematical and physical problems.

He had the cooperative mind and the highest unselfishness actuated all his relations with his fellow astronomers. He subordinated his own individuality in his work and even the interests of his observatory to the good of astronomical science. All the honors of the astronomical world were showered upon him and upon the institution which under his direction had led the queen of sciences into new triumphs in untrodden fields.

As it was said of Sir Christopher Wren that his monument was Saint Paul's Cathedral, so the monument of Professor Pickering is found in the ninety volumes of the Annals of Harvard College Observatory, a monument which as long as man looks up at the heavens and wonders and interprets, should be an honorable and enduring one.

JOEL H. METCALF.

JOHN ELLIOTT PILLSBURY (1846-1919).

Fellow in Class II, Section 1, 1893.

This distinguished naval officer and oceanographer was born at Lowell, Massachusetts, December 15, 1846, the son of John Gilman and Elizabeth Wimble (Smith) Pillsbury. His early education was received in the public schools, and at the age of fourteen he was appointed a page in the House of Representatives.

In 1862 he received from President Lincoln a nomination to the U. S. Naval Academy, from which he graduated in 1867, being commissioned ensign in 1868 and lieutenant in 1872.

He married Florence Greenwood Aitchison of Portland, Maine, August 26, 1873. Elsie Greenwood, later wife of Edward B. Richardson of Brookline, Mass., was the only issue of this marriage.

In 1875 he was ordered to the Hydrographic Office of the Navy Department and the following year detailed to the U. S. Coast Survey, where he gave ten years of service and placed his name permanently on the roll of those who have materially added to our knowledge of the secrets of the Ocean.

The investigation of the Gulf Stream was undertaken by the Survey on account of its importance to navigation as well as its scientific interest, and work was begun in 1883 with the schooner *Drift*, which, as her name implies, proved inadequate for the purpose and was replaced by the Coast Survey Steamer *Blake*.

New methods of current measurement and improved instruments for recording observations were devised by Pillsbury, and by the aid of the recently introduced steel cable anchorage was had, sometimes at a depth of over two miles. Observations extended from Tobago on the southeast to Hatteras on the north, and the movements and temperatures of this important current were definitely fixed over a great part of its course. Among the interesting new results of the work were the determination of daily fluctuations in the rate of flow more or less coincident with the tidal action, and the contribution of wave effect, driven by the trade winds, in increasing the movement of the stream.

During the Spanish War he commanded the dynamite cruiser *Vesuvius* and participated in the attack on San Juan, Porto Rico. He was later promoted to Commander and through the various grades to Rear Admiral and Chief of the Bureau of Navigation in 1908. He received all the medals for service and efficiency in the line of duty which under the law are granted by the Navy Department.

In 1909 he became a member of the Board of Managers of the National Geographic Society, Vice-president in 1915, and President of the Society in April, 1919; dying on December 30th of the same year.

A summary of his lifework is given in the Bulletin of the National Geographic Society of October 16, 1919. An account of the Gulf Stream work and results was given by Admiral Pillsbury in the National Geographic Magazine of August, 1912, and in Hydrographic Office publication No. 110, in 1894. A memoir on Charts and Chart-making was published in Proceedings of the U. S. Naval Institute No. 29, in February, 1894. An excellent portrait of the Admiral appeared in the National Geographic Magazine, volume 37, p. 341, in April, 1920.

The Admiral was elected a member of this Academy, April 12, 1893.

WILLIAM HEALEY DALL.

ARTHUR SEARLE (1837-1920).

Fellow in Class 1, Section 1, 1877.

Arthur Searle, who died October 23, 1920, was born in London on October 21, 1837. His father, Thomas Searle, was an American citizen and a descendant of Governor Thomas Dudley of Massachusetts. His mother, Anne Noble, came from Derby, England, being English by birth as well as by ancestry. Thomas Searle seems to have been naturally fitted for the life of a scholar and a man of letters, but the restricted means of the family deprived him of a college education, and forced him into mercantile business at an early age. At the time of his marriage in 1834 he was a partner in a firm of London bankers. It was during this sojourn in England that his son Arthur was born in 1837, and two years later his other son George. As a consequence of a commercial panic Thomas returned in 1840 to America with his family to look after business interests. His wife soon died, and two years after in 1843 he himself passed away, leaving the care of the two boys to his elder brother and a sister in Brookline, Mass.

Both boys were sent early to private schools in Brookline and Roxbury, partly for the reason as Searle afterward suspected, to make life easier for their elders, not accustomed to such lively youngsters. The last school days were passed at the Brookline High School. Entering Harvard College at the age of fourteen years, he was graduated in 1856, as the second scholar of his class. In 1859 he received his Master's degree. Arthur, though only six years old at the time of his father's death, had found in him a companion and an instructor. Under such influence, the scholarly aspirations of the father seemed to have been as seed to find fruition in the son's life. The boy had an alert mind. At the age of seven he began his habit of psychological introspection by the discovery, while meditating on some subject, that it was he himself who was thinking. Thus, he became aware of the personal identity that was Arthur Searle. Before this time he had made his first experiment in physics, namely, as to the effect of centrifugal force acting on a bit of wood placed inside the whirling rim of his aunt Becky's spinning wheel. At eleven years he was interested in the revolution in France, and began to have political opinions, which were always conservative. But anything of a scientific nature fascinated

him. The electric telegraph, anaesthetic surgery, the discovery of the planet Neptune in 1846, all appealed to his mind. Nor was he less gifted in other respects. His avidity for knowledge gave him even then the reputation of being a "walking dictionary." As a schoolboy, mathematics could be easily acquired while feeding his rabbits, and at college he found that he had already performed the chemical experiments which were being taught from a text-book without any provision for laboratory practice by the students. All branches of knowledge inside or outside the college curriculum interested him intensely, and he studied them all eagerly and thoughtfully. His first article was published in the *Harvard Magazine*, while he was still a student. It was on the plurality of worlds, and seemed prophetic of his future career, as he had no thought at the time of making astronomy a profession.

It was twelve years after graduation that Searle found his calling. The intervening time was a course in the university of life. Ill health led him to engage in farming for a time. Teaching, statistical work, and experience in a broker's office, all were tried. He also joined in a project to raise sheep in California, but the scheme after a brief trial was abandoned. Before returning home from California, he filled temporarily the place of an absent professor at Santa Clara.

In 1868, his brother George, who had been employed at the Harvard Observatory, resigned to study for the Catholic priesthood, and Arthur was asked to take his place. This he did, little thinking that at last he had found a permanent place with congenial occupation. The following year he was appointed Assistant, to be promoted to Assistant Professor in 1883, and Phillips Professor of Astronomy in 1887. In 1912 he became Phillips Professor Emeritus. Besides his Observatory work he also conducted astronomical courses at Radcliffe College from 1891 to 1912. He was married in 1873 to Emma Wesselhoeft, daughter of Dr. Robert Wesselhoeft of Boston. Mrs. Searle died in 1914. Two daughters survive their parents.

His earliest work at the Harvard Observatory was as a computer and observer. In the latter capacity he made observations of stars, double stars, nebulae, satellites of the planets, asteroids, and comets. These observations are contained in the *Annals of Harvard College Observatory*, Volumes 11, 13, 14, and 33; also in the *Proceedings of this Academy*, Volume 16. In 1889 he published in the *Annals of*

Harvard College Observatory, Volume 19, Part 1, the results, which he had gathered, of the early meteorological observations made at the Observatory from 1840 to 1888. Among these were included various miscellaneous observations relating to the aurora, lightning, meteors, earthquakes, and to some extent to the zodiacal light.

The zodiacal light was the subject of his first independent investigation. Beginning in 1874 he continued his observations of the zodiacal light and the Gegenschein until 1895, when the increasing use of electricity for street illumination made such work impossible in Cambridge. The results of these observations are contained in the *Astronomische Nachrichten*, Volumes 99, 102, 109, 116, 124, and 126, *Proceedings*, Volume 19, *Memoirs*, Volume 11; and the *Annals of the Harvard College Observatory*, Volumes 19, Part 2, and 33, Nos. 1, 2, and 3. Summaries of information written by him on the subject appear in the *Monthly Weather Review* and elsewhere.

The several lines of his inquiry dealt with the permanence, position, and magnitude of the ordinary western zodiacal light; the normal distribution of light in the zodiac and vicinity; and the position, parallax, and brightness of the Gegenschein. His studies led him to favor the hypothesis ascribing the phenomenon to light reflected from small meteoric bodies. He published a statement on the "Meteoric Theory of the Gegenschein" also in the English periodical, *Observatory*, August, 1899. Although he considered the meteoric hypothesis as the most probable explanation, he felt that his series of observations should be extended to reach a definite conclusion. The research should include the orbital movements and the light of asteroids and periodic comets. He expressed the hope that younger observers more favorably located might carry out his plan.

In the Observatory he was frequently engaged in the business management, particularly during the interim between Director Winlock's death and Professor Pickering's appointment. It was at this time that he published Volume 8 of the *Harvard Annals*, containing his account of the history of the Observatory from 1855 to 1876, with a description of the buildings, instruments and of work done. The volume included also a series of illustrations of Sun, planets, and other celestial objects, which had been drawn mostly by Trouvelot during Winlock's directorship.

Professor Searle spent ten years — from 1888 to 1898 — in making

the meridian circle observations for the Zone Catalogue of 8337 Stars between $9^{\circ} 50'$ and $14^{\circ} 10'$ of South Declination in 1855 for the Epoch 1900.0. The results fill Volumes 62, 65, 66, 67, and 70 of the Harvard Annals. The Catalogue itself, contained in Volume 67, was published in cooperation with the Astronomische Gesellschaft. The reduction and publication of these observations with the superintendence of other computers consumed most of his time and energy until he retired in 1912. With his customary modesty, he regarded this not as a personal undertaking but as a large piece of routine work. Nevertheless, the various investigations related to meridian circle observations, which he undertook in the course of the work, show his skill and ingenuity in meeting such problems. They are indicated in the Introduction to the Catalogue just mentioned. Reference may be made here to "Results of Accessory Series of Observations made with the Meridian Circle," and "Comparison of Results obtained with different Forms of Apparatus in Meridian Observations," in the Annals of Harvard College Observatory, Volumes, 33, No. 11, and 41, No. 7. In 1908 he published in the Harvard Annals, Volume 60, No. 1, "Geometrical Methods in the Theory of Combining Observations." In the Annals, Volume 29, No. 6 are his observations of β Persei, and surrounding comparison stars.

Besides various articles in periodicals, he published "Outlines of Astronomy" in 1874, followed by a second edition in 1875. In 1910 his "Essays I-XXX" appeared, which, among other topics, discussed "Space and Time," interesting in the light of the theory of relativity.

Professor Searle became a Fellow of the Academy in 1877, at the same time with Professor Charles R. Cross, who recently died. His scientific papers presented to the Academy, and not already mentioned are in the *Proceedings*, Volumes 19, 24, and 55. The last paper "Orbits Resulting from Assumed Laws of Motion" was a result of an extensive investigation begun in 1882, forming an important part of a treatise which he had practically completed at the time of his death. Reading this paper on the balanced effect of "inward" and "outward" forces on a moving body, one is carried back to the initial physical experiment, which he performed in his childhood with the help of his aunt's spinning wheel.

He was very much of a mathematician, and when any question of the sort arose he was consulted. The results will be found in various

places. For example, in the paper on "Stellar Photometry" published in the *Proceedings*, Volume 11, the discussion of the path described by stars at various declinations in the field of a telescope when the axis is not properly adjusted, was prepared by him. Not only a mathematician, he was proficient in many languages. "A Note on the Battle of Pharsalus" was the result of re-reading Caesar's "De Bello Civili," which he did for recreation. He amused himself in writing verse both in Latin and in English. One of these poems written at the time of his wife's death has been published since his own death; the Latin version in the Harvard Graduates' Magazine, the English version in Popular Astronomy.

Professor Searle was the most modest of men. His extremely retiring disposition probably accounts for his not accepting Dr. Gould's invitation in 1869 to go as his assistant to Cordoba. Later, he might have been appointed director of another observatory, if he had been willing. His life flowed in a quiet stream. It was as he would have it. The turmoil of strenuous life did not attract him. From youth he was not keen for even the ordinary pleasures of society, and yet he had many warm friends, and a host of acquaintances. All who knew him well, were delighted with his conversational powers. His sense of humor and the merry twinkle in his eye as he recounted some episode were passports to friendliness. His philosophical studies made his thinking clear. When he spoke, it was as one having the authority of careful thought. In discussing any subject he had a succinctness of expression which swept away all intricacies and left the matter in outlines readily understood. He was of a type, not so common at the present day, of a scholarly gentleman, versed in many branches of learning, and keenly susceptible to the delights of music, of art, and the manifestations of nature.

EDWARD S. KING.

WILLIAM THOMPSON SEDGWICK (1855-1921).

Fellow in Class II, Section 3, 1886.

William T. Sedgwick, a Fellow of the American Academy of Arts and Sciences since 1886, died suddenly in Boston, January 25, 1921, at the age of 66 years, while still in the full tide of his activities as a

teacher, investigator and public servant. The son of William and Anne Thompson Sedgwick, and a descendant of Robert Sedgwick, who settled in Boston in 1636, he was born in West Hartford, Connecticut, December 29, 1855, and throughout his life cherished the traditions of his New England origin and training. He graduated with high rank from the Sheffield Scientific School of Yale University in 1877, and taught physiological chemistry in Chittenden's laboratory in 1878-1879. In 1879 he became Fellow and subsequently Assistant in Biology at Johns Hopkins University, where he took the degree of Ph.D. in 1881, and in the same year married Mary Catherine Rice of New Haven. He received the honorary degrees of Sc.D. (Yale, 1909) and LL.D. (University of Cincinnati, 1920) and was a member of many learned societies, serving as president of the American Society of Naturalists, of the American Public Health Association, and of the Society of American Bacteriologists, of which he was one of the founders and the first president. He was a member of the International Health Board of the Rockefeller Foundation, of the Advisory Board of the United States Hygienic Laboratory, of the Public Health Council of Massachusetts, of the Royal Sanitary Institute of Great Britain, and of other important organizations. He served as president of the Boston Civil Service Reform Association in 1900 and of the State Association in 1901; and from 1897 down to the time of his death was curator of the Lowell Institute of Boston.

In 1883 he became Professor of Biology in the Department of Biology, later known as the Department of Biology and Public Health, at the Massachusetts Institute of Technology, then under the presidency of Francis Walker. As head of that department he began a service in the teaching of general biology and in the public health movement in America that continued for nearly forty years and brought distinction alike to himself and to his institution, rendering his laboratory one of the important centers of biological work in America. The culmination of the honors that he received came in the last year of his life when he served as exchange professor to the universities of Cambridge and of Leeds, and also as a representative of the Institute of Technology, Harvard University, the American Public Health Association and the U. S. Public Health Service at the International Health Conference at Brussels. In both capacities, as foreign observers have testified, his lectures and addresses made a

deep impression, carrying a message from America to the older world that went far beyond the merely technical aspects of his subject.

He was the author of important technical papers and general addresses, too numerous to be listed here, and also of several larger works. Among these may be mentioned the "General Biology," a text-book published jointly with E. B. Wilson (1886), "The Human Mechanism," published with Theodore Hough (1906), "A Short History of Science," with H. W. Tyler (1917), and above all the "Principles of Sanitary Science" (1902) which at once took its place as the standard work on the subject and assured Sedgwick's position as one of the foremost leaders in this field.

Sedgwick's life was the uneventful one of a teacher and investigator, happy in his work, in his friends and in a home life singularly congenial and rich; but even its bare outline impresses us with his versatility and the wide range of his interests. He was a born teacher, one who loved his work and kept always in view a higher ideal than merely to impart information. He knew how to inspire his students and followers with his own buoyant eagerness, thoroughness and tenacity of purpose. He taught them to think straight, aim high and work hard. A sane and good humored optimism was inseparable from his personality; and not less characteristic were the sturdy common sense and shrewd sense of humor with which he was wont to illuminate the dry technicalities of his subject, driving home the underlying principles by the use of homely and telling illustrations that made them living realities never to be forgotten. In these respects Sedgwick was indeed a teacher unrivalled, as many generations of "Tech" students can bear witness. He made comrades of his students, and they gave to him affectionate and enduring friendship. Alike by precept and by the example of his own life he taught them that man does not live by bread alone; that the student of science fails to attain his largest measure of success if his mind be not kept open to the larger world of literature, art and human fellowship. His students felt towards him an almost filial regard and learned to look to him in their later lives for wise and helpful counsel. In this respect he has with good reason been compared to Dr. Arnold, but as one of his former students has finely said: "The master of Rugby was far off on the snowy heights. Sedgwick was in the midst of the rush of life and he held us by the hand."

Though Sedgwick's early inclination was towards the study of physiology and medicine he later gravitated irresistibly into sanitary science and conservation of the public health; and in this field he was one of the earliest and most prominent pioneers. He and his many pupils contributed more than any other to the emancipation of these subjects from medicine in the narrower sense, and their recognition as important independent branches of applied biology which offer the widest opportunities for public service outside the practise of medicine. To this end he contributed by important studies on epidemics, largely in connection with the work of the State Board of Health of Massachusetts and the Lawrence Experimental Station, by the work of numerous students trained in his laboratory, and especially by the publication in 1902 of his authoritative work on Sanitary Science and the Public Health, referred to above, which has recently been characterized by competent authority as still the best existing epitome of the subject.

The interest in public welfare displayed in these various activities, was but one side of a larger interest in educational and civic problems that drew him into many other forms of public service. He was a valued member or trustee of many public institutions, in and outside of Boston. He played a prominent part in the struggle for civil service reform in Massachusetts in 1900-1901, and then and later delivered many public addresses on subjects connected with the general welfare. During his long service as curator of the Lowell Institute he became widely known to the citizens of Boston, winning general esteem by the breadth of view and enlightened regard for the public interest with which for so many years he administered his important trust.

As one who had the privilege of intimate friendship with him for more than forty years, the writer may be permitted finally to emphasize Sedgwick's high minded and noble character. He was a man of vision, of lofty ideals, of faith in the eternal fitness of things. No man was less self-seeking or more appreciative of others. He was kindly, generous and human, with a gift for friendship that made him the center of an always enlarging circle of friends and enriched his life with widely varied human interests. To those friends he gave a loyalty and ever ready helpfulness that knew no change with the passing years. He exemplified the best traditions of his profession as

an inspiring teacher and a leader of research in his chosen field. His friends and colleagues rejoiced in his achievements as if they had belonged in part to them; and they will cherish the memory of his happy and useful life.¹

EDMUND B. WILSON.

ELMER ERNEST SOUTHARD (1876-1920).

Fellow in Class II, Section 4, 1911.

Dr. Elmer Ernest Southard died in New York City on February 8, 1920 after a very brief illness at the age of forty-three.

When stricken down by the fatal infection he was busily engaged in making a series of communications dealing with his special field of work. He was at the height of his power, and his accomplishments might well be considered an earnest of still richer productivity in the years to come. A man of incessant industry, with a keen and alert intellect, restlessly searching after the solution of age-long problems, he had a personality which won him many warm friendships, and a talent for inspiring his associates and pupils.

After an education in the public schools of Boston, and at Harvard College, he graduated from the Medical School in 1901. Immediately after graduation he began to occupy himself with that sphere of investigation with which he later continued to identify himself so closely. He became early associated with the pathological work of the Massachusetts State Hospitals for the Insane. In 1909 he became Bullard Professor of Neuropathology. In 1912 he was appointed Director of the newly established Boston Psychopathic Hospital (at that time called the Psychopathic Department of the Boston State Hospital).

The value of a scientific worker is only in part to be estimated by the published results of his personal investigations. Equally important may be the influence of the worker on associates and pupils, on the community where he lives, on the whole body of professional workers who are working in the same field as himself. The influence

¹ The writer desires to acknowledge his indebtedness to appreciative reviews of Professor Sedgwick's life and work by two of his former pupils, Samuel C. Prescott (*Technology Review* for April, 1921) and C. E. A. Winslow (*Journal of Bacteriology*, May, 1921).

of Dr. Southard radiated widely throughout the country, and there are many serious workers in widely scattered centers who owe their inspiration to him. His publications witness to the great industry of the man. They cover a wide field; they furnish an important body of material which has been incorporated in the general body of knowledge which pertains to the disciplines of neuropathology and of psychiatry.

In the Southard Memorial Number of the Bulletin of the Massachusetts Department of Mental Diseases a complete bibliography of his works is published, with brief comments and abstracts (pp. 30-199). The earlier communications deal with the more technical aspects of morbid processes, involving the central nervous system. They are detailed studies of tissue reactions which do not involve the categories of the personality. In later communications the reactions of the individual began to play a prominent rôle, and the question of the correlation of structural damage with functional inefficiency became a central problem. One of the fundamental problems of psychiatry, namely, the basal conditions underlying mental deterioration, or, to put it in another way, the etiology of so-called "dementia praecox," was a subject of much careful investigation on his part. These are problems of very complex nature, and in the formulation of his views Dr. Southard not only brought together much interesting material, but showed a lightness of touch and ingenuity of expression which charmed those who read his papers.

The position of Director of the Psychopathic Hospital brought with it new responsibilities and interests which reflected themselves in his investigations. He had passed from the investigation of mere tissue to the study of the morbid activity of the individual, and now he was brought to deal with the problems of mental health in relation to community life. Work of this type necessarily brings a great variety of problems, and in regard to them Dr. Southard showed his usual keen insight and fertility of resources. He contributed papers on the treatment of special types of disease, on hospital organization, on the training of special types of workers, on the relationship of the hospital to the community, on the possibility of making available to industrial organizations the principles which had been worked out in the limited sphere of the hospital.

The war brought its special problems in his field, and he contributed

a book on "Shell-shock and Other Neuropsychiatric Problems presented in 589 Case Histories from the War Literature, 1914-1918."

Throughout all these various interests the fundamental fascination of the problem of the relation of structure to function continued, and in a boldly outlined program for research into the basis of feeble-mindedness he sought to determine the "minimum brain machinery with which speech and thought processes get performed." Two Research Series have already been published — the Waverley Researches in the Pathology of the Feeble-Minded (Memoirs of the American Academy of Arts and Sciences, Vol. XIV, No. II. May, 1918; Vol. XIV, No. III. December, 1921). In these researches Dr. Southard and his associates have furnished a standard for scientific work in this field.

A general survey of the work done by Dr. Southard shows a growing breadth of vision and steadily maturing genius, and those working in this special field of medicine realize what a tragedy it was when it was suddenly deprived of one of its most brilliant workers.

C. M. CAMPBELL.

BARRETT WENDELL (1855-1921).

Fellow in Class III, Section 4, 1889.

Barrett Wendell, a member of this Academy since 1889 was born in Boston on October 23, 1855, and died on February 9, 1921. He was the son of Jacob and Mary Bartoldi (Barrett) Wendell. His first American ancestor on the paternal side was Evart Jansen Wendell, who came from Emden in East Friesland to New York about 1640 when some twenty-five years old.

Entering Harvard with the Class of 1876, he was compelled by ill health to leave college for a year; consequently he took his A.B. degree with the Class of '77. During 1877-8 he attended the Harvard Law School and later was a student in offices both in New York and Boston, but his early intention to follow the law was abandoned for the work of teaching and writing English following his appointment in 1880 as an instructor at Harvard. He served the college in this capacity until 1888 when he was made an Assistant Professor. Ten

years later he became a full Professor of English, holding that office until 1917, when he resigned and was chosen Professor Emeritus.

During the thirty-seven years of his incumbency at Harvard Wendell was a positive constructive force in the fields of English composition and of comparative literature. He substituted for more formal methods a frank incisiveness of speech and an independence of outlook that challenged the interest and won the affection of nearly three generations of students. The class room audiences who found his controversial attitude engaging never failed to perceive the wisdom, genial humor and passionate sympathy with what is best in literature that underlay his marked and sometimes whimsical peculiarities. To the individual seeking aid he gave of himself in generous measure never to be forgotten by the recipient.

From the outset of his career as a teacher of English Wendell was also an industrious writer. Before the appearance in 1891 of his "English Composition," a text book widely adopted, he had published two novels, "The Duchess Emilia" in 1885 and "Rankell's Remains" in 1887. In the following order appeared "Cotton Mather," 1891; "Stelligeri and Other Essays Concerning America," 1893; "William Shakespeare, a Study in Elizabethan Literature," 1894; "A Literary History of America," 1900; "Raleigh in Guiana," "Rosamond" and "A Christmas Masque," 1902; "The Temper of the Seventeenth Century in English Literature" (his lectures at Trinity College, Cambridge, England, in 1902-1903-1904), 1904; "History of Literature in America" (written in collaboration with Chester N. Greenough), 1904; "Liberty, Union and Democracy — the National Ideals of America," 1906; "The France of Today," 1907; "The Privileged Classes," 1908; "The Mystery of Education," 1909; and finally, in 1920, "The Traditions of European Literature," the second and concluding volume of which was interrupted by his final illness.

Of these writings it may be said that his "Cotton Mather" and his "English Composition" stand out in the product of his early period; his "A Literary History of America," which contradicted the judgments of the sages and aspersed some idols, has become with time a standard treatise; his "The France of Today" (delivered originally as Lowell lectures) opened the eyes of Americans to their ignorance of French racial characteristics. The sympathetic insight displayed in this book was so deeply appreciated by the French people that since

his death one of the lecture halls of the Sorbonne has been renamed after him "Hall Barrett Wendell." "The Traditions of European Literature," only one volume of which he completed, was a labor of love, the fruition of years of discerning scholarship. The period from Homer to Dante was covered by the first volume and the second would have brought the survey down to modern times.

During his sabbatical vacations Wendell visited Europe at various times. In 1902-3 he represented Harvard University at the 300th anniversary of the Bodleian Library at Oxford, and was Clark lecturer at Trinity College, Cambridge, England. In 1904-5 he was the first of the annual lecturers on the Hyde foundation at the Sorbonne and other French universities. In 1911 he went around the world, traveling in India, China and Japan.

Wendell was a member of the American Academy of Arts and Letters, of the Massachusetts Historical Society, and a Fellow of the American Academy of Arts and Sciences. He received from Columbia University in 1913 the honorary degree of Doctor of Letters (Litt. D.); Harvard University conferred upon him the same degree in 1918, and Strassburg University, France, that of Doctor of Laws (LL.D.) in 1920.

Wendell was a man of pronounced individuality, warm in his sympathies, singularly loyal in his attachments, and free from littleness. He never concealed his convictions, which were often critical of modern tendencies and points of view. If he seemed to champion the past at the expense of the present, it was because of his insistence on standards and his veneration for the summits not the table lands of tradition. His conversation had the charm of freedom from the commonplace.

Wendell was married on June 1, 1880, to Edith Greenough of Quincy, who, with two sons and two daughters, survive him.

ROBERT GRANT.

ANDREW DICKSON WHITE (1832-1918).

Fellow in Class III, Section 2, 1868.

Andrew Dickson White was born in Homer, November 7, 1832, and died in Ithaca, only twenty-five miles from his birth-place, on November 4, 1918. As a student at Hobart College and later at Yale, he

was impressed with the inadequacy and narrowness of the college training of those days. This feeling increased as he grew older and when Ezra Cornell consulted him as to the best employment of some of his wealth for the public benefit, Mr. White soon succeeded in inspiring him with the vision which became embodied in Cornell University. Mr. White became of course the president of the new university and it is to him that we owe the placing of scientific and technical courses on a level with the humanities. The development of Cornell has been a striking illustration both of the power of the ideal and of Mr. White's wisdom. It is scarcely an exaggeration to say that Cornell has been successful in so far as it has followed the ideals of its first president. The principles that he laid down over fifty years ago are likely to guide the course of the University for years to come.

People wondered in the early days why a man like Goldwin Smith should leave Oxford and come to Cornell; but it was the spirit of protest in him that made him love Cornell to the end of his life. At Cornell they were trying to do something new and worth while. It was the spirit of Andrew D. White that appealed to Goldwin Smith.

Though Mr. White's real reputation will rest on the work that he did in starting Cornell University as the embodiment of an ideal, this was by no means the whole of his work. His "History of the Warfare of Science with Theology in Christendom" and his Autobiography are the two works which the general public knows, and it is sometimes forgotten that he was one of the founders of the American Historical Association and its first president. While president of Cornell University he was also professor of Modern European history. In 1887 he presented to Cornell his historical library and it was only fitting that the combined departments of history and political science should be known officially as "The President White School of History and Political Science."

Mr. White's diplomatic career was varied and honorable. He was minister plenipotentiary to Germany from 1879 to 1881 and to Russia from 1892 to 1894 and later ambassador to Germany from 1897 to 1902.

A man of means and a wonderful host, he kept open house in Ithaca. Distinguished visitors to this country always visited Mr. White and no one who lived in Ithaca during the last years of Mr. White's life can fail to realize what he meant to the social life of the faculty. The

University very properly bears the name of its founder, Ezra Cornell; but no one will question that it was Andrew D. White who put the breath of life into the young institution.

Honors of course came to Mr. White in profusion. He enjoyed them keenly but they did not change him. A list of these, with other information, may be found in an obituary notice published in the *Memoirs of the New England Historic Genealogical Society*, Vol. 73, p. LX (1919).

WILDER D. BANCROFT.

American Academy of Arts and Sciences

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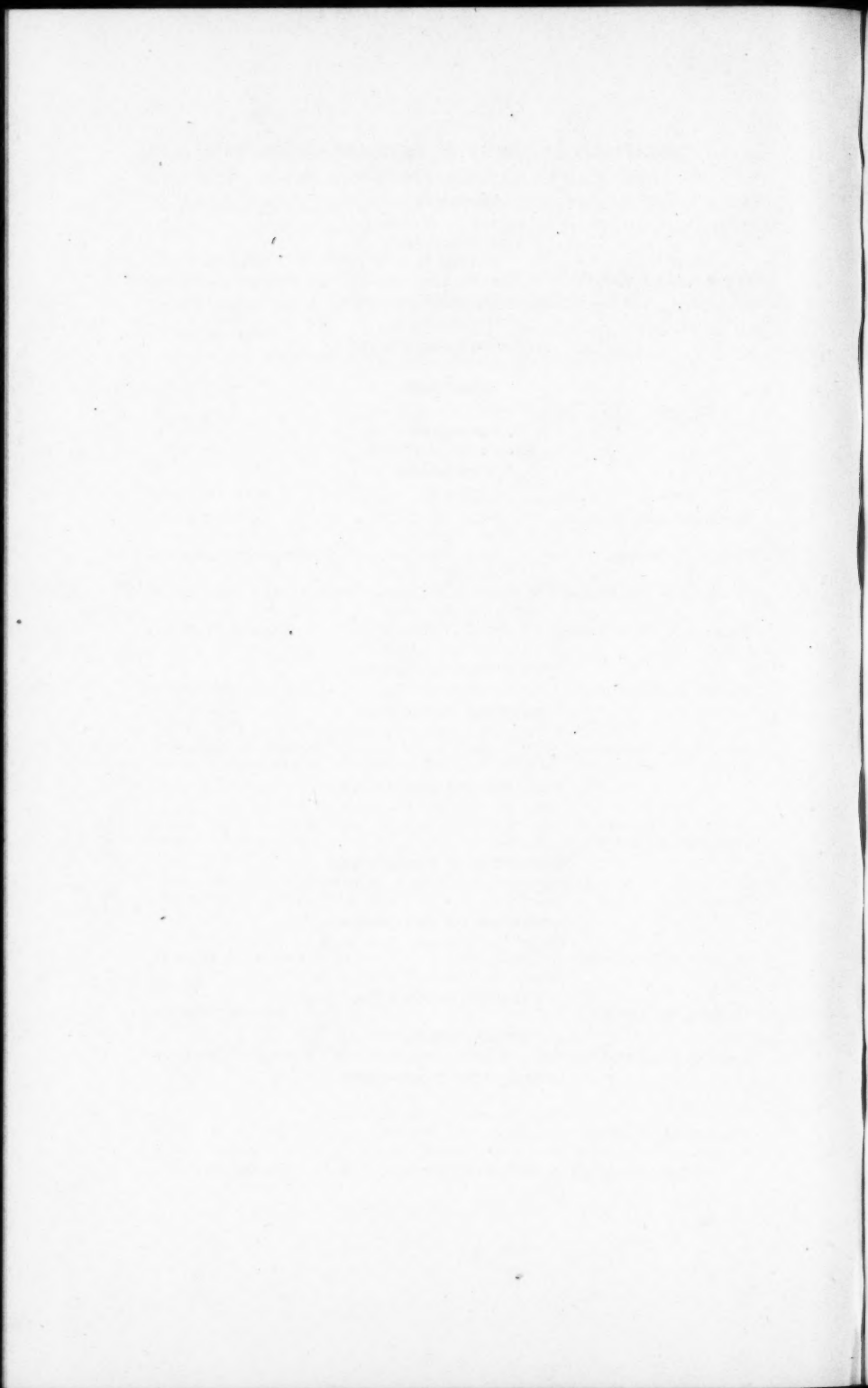
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¹ Appointed Nov. 8, 1922, to fill the term of H. H. Edes, deceased.



LIST
OF THE
FELLOWS AND FOREIGN HONORARY MEMBERS.

(Corrected to October 20, 1922.)

FELLOWS.— 579.

(Number limited to six hundred.)

CLASS I.— *Mathematical and Physical Sciences.*— 195.

SECTION I.— *Mathematics and Astronomy.*— 46.

Charles Greeley Abbot	Washington, D. C.
Walter Sydney Adams	Pasadena, Cal.
George Russell Agassiz	Boston
Raymond Clare Archibald	Providence, R. I.
Solon Irving Bailey	Cambridge
Edward Emerson Barnard	Williams Bay, Wis.
George David Birkhoff	Cambridge
Ernest William Brown	New Haven, Conn.
William Elwood Byerly	Cambridge
Florian Cajori	Berkeley, Cal.
William Wallace Campbell	Mt. Hamilton, Cal.
Julian Lowell Coolidge	Cambridge
George Cary Comstock	Madison, Wis.
Leonard Eugène Dickson	Chicago, Ill.
Philip Fox	Evanston, Ill.
Fabian Franklin	New York, N.Y.
Edwin Brant Frost	Williams Bay, Wis.
Frank Lauren Hitchcock	Belmont
Edward Vermilye Huntington	Cambridge
Dunham Jackson	Minneapolis, Minn.

Oliver Dimon Kellogg	Cambridge
Edward Skinner King	Cambridge
Carl Otto Lampland	Flagstaff, Ariz.
Joseph Lipka	Cambridge
Joel Hastings Metcalf	Portland, Me.
George Abram Miller	Urbana, Ill.
Clarence Lemuel Elisha Moore	Watertown
Eliakim Hastings Moore	Chicago, Ill.
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Harlow Shapley	Cambridge
Vesto Melvin Slipher	Flagstaff, Ariz.
Frederick Slocum	Middletown, Conn.
Virgil Snyder	Ithaca, N. Y.
Joel Stebbins	Madison, Wis.
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Henry Taber	Worcester
Harry Walter Tyler	Newton
Robert Wheeler Willson	Cambridge
Frederick Shenstone Woods	Newton

CLASS I., SECTION II.—*Physics*.—56.

Joseph Sweetman Ames	Baltimore, Md.
Samuel Jackson Barnett	Washington, D. C.
Carl Barus	Providence, R. I.
Louis Agricola Bauer	Washington, D. C.
Louis Bell	Newton
Percy Williams Bridgman	Cambridge
George Ashley Campbell	New York, N. Y.
Leslie Lyle Campbell	Boston
Emory Leon Chaffee	Belmont

Daniel Frost Comstock	Cambridge
William David Coolidge	Schenectady, N. Y.
Henry Crew	Evanston, Ill.
Harvey Nathaniel Davis	Cambridge
Arthur Louis Day	Corning, N. Y.
Louis Derr	Brookline
William Johnson Drisko	Winchester
William Duane	Boston
Alexander Wilmer Duff	Worcester
Arthur Woolsey Ewell	Worcester
William Suddards Franklin	Cambridge
Harry Manley Goodwin	Brookline
George Ellery Hale	Pasadena, Cal.
Edwin Herbert Hall	Cambridge
Hammond Vinton Hayes	Boston
John Charles Hubbard	New York, N. Y.
Gordon Ferrie Hull	Hanover, N. H.
Charles Clifford Hutchins	Brunswick, Me.
Frederic Eugene Ives	Philadelphia, Pa.
James Edmund Ives	Washington, D. C.
William White Jacques	Boston
Edwin Crawford Kemble	Cambridge
Norton Adams Kent	Cambridge
Frank Arthur Laws	Boston
Henry Lefavour	Boston
Theodore Lyman	Brookline
Thomas Corwin Mendenhall	Ravenna, O.
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Albert Abraham Michelson	Chicago, Ill.
Dayton Clarence Miller	Cleveland, O.
Robert Andrews Millikan	Chicago, Ill.
Harry Wheeler Morse	Los Angeles, Cal.
Edward Leamington Nichols	Ithaca, N. Y.
Ernest Fox Nichols	New Haven, Conn.
Charles Ladd Norton	Boston
George Washington Pierce	Cambridge
Michael Idvorsky Pupin	New York, N. Y.
Frederick Albert Saunders	Cambridge

John Stone Stone	New York, N. Y.
Maurice deKay Thompson	Brookline
Elihu Thomson	Swampscott
John Trowbridge	Cambridge
Arthur Gordon Webster	Worcester
David Locke Webster	Palo Alto, Cal.
Edwin Bidwell Wilson	Brookline
Robert Williams Wood	Baltimore, Md.
John Zeleny	New Haven, Conn.

CLASS I., SECTION III.—*Chemistry*.—51.

Wilder Dwight Bancroft	Ithaca, N. Y.
Gregory Paul Baxter	Cambridge
Arthur Alphonzo Blanchard	Cambridge
Marston Taylor Bogert	New York, N. Y.
Bertram Borden Boltwood	New Haven, Conn.
William Crowell Bray	Berkeley, Cal.
Russell Henry Chittenden	New Haven, Conn.
Arthur Messinger Comey	Cambridge
Charles William Eliot	Cambridge
Henry Fay	Boston
George Shannon Forbes	Cambridge
Edward Curtis Franklin	Palo Alto, Cal.
Frank Austin Gooch	New Haven, Conn.
Lawrence Joseph Henderson	Cambridge
Charles Loring Jackson	Boston
Walter Louis Jennings	Worcester
Grinnell Jones	Cambridge
Frederick George Keyes	Cambridge
Elmer Peter Kohler	Cambridge
Charles August Kraus	Worcester
Arthur Becket Lamb	Cambridge
Irving Langmuir	Schenectady, N. Y.
Gilbert Newton Lewis	Berkeley, Cal.
Warren Kendall Lewis	Boston
Arthur Dehon Little	Brookline
Charles Frederic Mabery	Cleveland, O.

Forris Jewett Moore	Boston
George Dunning Moore	Worcester
Edward Williams Morley	West Hartford, Conn.
Edward Mueller	Cambridge
Samuel Parsons Mulliken	Boston
Charles Edward Munroe	Forest Glen, Md.
James Flack Norris	Boston
Arthur Amos Noyes	Pasadena, Cal.
William Albert Noyes	Urbana, Ill.
Thomas Burr Osborne	New Haven, Conn.
Samuel Cate Prescott	Brookline
Ira Remsen	Baltimore, Md.
Robert Hallowell Richards	Jamaica Plain
Theodore William Richards	Cambridge
Martin André Rosanoff	Pittsburgh, Pa.
Stephen Paschall Sharples	Cambridge
Miles Standish Sherrill	Brookline
Harry Monmouth Smith	Brookline
Julius Oscar Stieglitz	Chicago, Ill.
Henry Paul Talbot	Newton
Richard Chase Tolman	Washington, D. C.
William Hultz Walker	Boston
Willis Rodney Whitney	Schenectady, N. Y.
Robert Seaton Williams	Cambridge
Alpheus Grant Woodman	Watertown

CLASS I., SECTION IV.—*Technology and Engineering.*—42.

Henry Larcom Abbot	Cambridge
Comfort Avery Adams	Cambridge
Bernard Arthur Behrend	Boston
William Herbert Bixby	Chicago, Ill.
Francis Tiffany Bowles	Boston
Charles Francis Brush	Cleveland, O.
William Hubert Burr	New Canaan, Conn.
John Joseph Carty	New York, N.Y.
Harry Ellsworth Clifford	Newton
Arthur Powell Davis	Washington, D. C.

Theodore Harwood Dillon	Cambridge
Gano Dunn	New York, N. Y.
William Frederick Durand	Palo Alto, Cal.
Frederic Harold Fay	Boston
Desmond FitzGerald	Brookline
John Ripley Freeman	Providence, R. I.
George Washington Goethals	New York, N. Y.
John Hays Hammond	New York, N. Y.
Rudolph Hering	Montclair, N. J.
Ira Nelson Hollis	Worcester
Hector James Hughes	Cambridge
Alexander Crombie Humphreys	New York, N. Y.
Dugald Caleb Jackson	Cambridge
Lewis Jerome Johnson	Cambridge
Arthur Edwin Kennelly	Cambridge
Gaetano Lanza	Philadelphia, Pa.
Charles Thomas Main	Winchester
Lionel Simeon Marks	Cambridge
Edward Furber Miller	Newton
Frederick Law Olmsted	Brookline
Charles Francis Park	Boston
William Barclay Parsons	New York, N. Y.
Harold Pender	Philadelphia, Pa.
Albert Sauveur	Cambridge
Peter Schwamb	Arlington
Henry Lloyd Smyth	Cambridge
Charles Milton Spofford	Brookline
Charles Proteus Steinmetz	Schenectady, N. Y.
George Fillmore Swain	Cambridge
George Chandler Whipple	Cambridge
Robert Simpson Woodward	Washington, D. C.
Joseph Ruggles Worcester	Boston

CLASS II.—*Natural and Physiological Sciences.*—185.SECTION I.—*Geology, Mineralogy, and Physics of the Globe.*—55.

Wallace Walter Atwood	Worcester
George Hunt Barton	Cambridge
Norman Levi Bowen	Washington, D. C.
Isaiah Bowman	Washington, D. C.
John Casper Branner	Palo Alto, Cal.
Thomas Chrowder Chamberlin	Chicago, Ill.
John Mason Clarke	Albany, N. Y.
Henry Helm Clayton	Canton
Herdman Fitzgerald Cleland	Williamstown
William Otis Crosby	Jamaica Plain
Reginald Aldworth Daly	Cambridge
Edward Salisbury Dana	New Haven, Conn.
William Morris Davis	Cambridge
Benjamin Kendall Emerson	Amherst
William Ebenezer Ford	New Haven, Conn.
James Walter Goldthwait	Hanover, N. H.
Louis Caryl Graton	Cambridge
Herbert Ernest Gregory	New Haven, Conn.
William Jackson Humphreys	Washington, D. C.
Ellsworth Huntington	Milton
Oliver Whipple Huntington	Newport, R. I.
Robert Tracy Jackson	Peterborough, N. H.
Thomas Augustus Jagger	Honolulu, H. I.
Douglas Wilson Johnson	New York, N. Y.
Arthur Keith	Washington, D. C.
James Furman Kemp	New York, N. Y.
Alfred Church Lane	Cambridge
Andrew Cowper Lawson	Berkeley, Cal.
Charles Kenneth Leith	Madison, Wis.
Waldemar Lindgren	Brookline
Frederic Brewster Loomis	Amherst
Alexander George McAdie	Readville
John Campbell Merriam	Washington, D. C.
William John Miller	Northampton

Charles Palache	Cambridge
Raphael Pumpelly	Newport, R. I.
Percy Edward Raymond	Cambridge
William North Rice	Middletown, Conn.
Austin Flint Rogers	Palo Alto, Cal.
Robert Wilcox Sayles	Cambridge
Waldemar Theodore Schaller	Washington, D. C.
Charles Schuchert	New Haven, Conn.
William Berryman Scott	Princeton, N. J.
Hervey Woodburn Shimer	Watertown
Thomas Wayland Vaughan	Washington, D. C.
Charles Doolittle Walcott	Washington, D. C.
Robert DeCourcy Ward	Cambridge
Charles Hyde Warren	New Haven, Conn.
David White	Washington, D. C.
Herbert Percy Whitlock	New York, N. Y.
Bailey Willis	Palo Alto, Cal.
Arthur Winslow	Boston
John Eliot Wolff	Cambridge
Jay Backus Woodworth	Cambridge
Frederick Eugene Wright	Washington, D. C.

CLASS II., SECTION II.—*Botany*.—34.

Oakes Ames	North Easton
Irving Widmer Bailey	Cambridge
Liberty Hyde Bailey	Ithaca, N. Y.
Edward Wilber Berry	Baltimore, Md.
Douglas Houghton Campbell	Palo Alto, Cal.
George Perkins Clinton	New Haven, Conn.
John Merle Coulter	Chicago, Ill.
Bradley Moore Davis	Ann Arbor, Mich.
Edward Murray East	Jamaica Plain
Rollins Adams Emerson	Ithaca, N. Y.
Alexander William Evans	New Haven, Conn.
Merritt Lyndon Fernald	Cambridge
George Lincoln Goodale	Cambridge
Robert Almer Harper	New York, N. Y.

John George Jack	East Walpole
Edward Charles Jeffrey	Cambridge
Fred Dayton Lambert	Tufts College
Jacob Goodale Lipman	New Brunswick, N. J.
Burton Edward Livingston	Baltimore, Md.
George Richard Lyman	Washington, D. C.
Elmer Drew Merrill	Manila, P. I.
Winthrop John Vanleuven Osterhout	Cambridge
Charles Vancouver Piper	Washington, D. C.
Alfred Rehder	Jamaica Plain
Benjamin Lincoln Robinson	Cambridge
Charles Sprague Sargent	Brookline
William Albert Setchell	Berkeley, Cal.
Arthur Bliss Seymour	Cambridge
Erwin Frink Smith	Washington, D. C.
John Donnell Smith	Baltimore, Md.
William Codman Sturgis	New York, N. Y.
Roland Thaxter	Cambridge
William Trelease	Urbana, Ill.
William Henry Weston, Jr.	Cambridge

CLASS II., SECTION III.—*Zoölogy and Physiology*.—57.

Nathan Banks	Cambridge
Thomas Barbour	Cambridge
Francis Gano Benedict	Boston
Henry Bryant Bigelow	Concord
Robert Payne Bigelow	Brookline
William T. Bovie	Milton
John Lewis Bremer	Boston
Charles Thomas Brues	Boston
Hermon Carey Bumpus	Providence, R. I.
Walter Bradford Cannon	Cambridge
Thorne Martin Carpenter	Boston
William Ernest Castle	Belmont
Charles Value Chapin	Providence, R. I.
Benjamin Preston Clark	Boston
Samuel Fessenden Clarke	Williamstown

Edwin Grant Conklin	Princeton, N. J.
Joseph Augustine Cushman	Sharon
William Healey Dall	Washington, D. C.
Charles Benedict Davenport	Cold Spring Harbor, N. Y.
Gilman Arthur Drew	Woods Hole
Cecil Kent Drinker	Boston
Alexander Forbes	Milton
Samuel Henshaw	Cambridge
Leland Ossian Howard	Washington, D. C.
Herbert Spencer Jennings	Baltimore, Md.
Charles Willison Johnson	Brookline
Charles Atwood Kofoid	Berkeley, Cal.
Frederic Thomas Lewis	Waban
Ralph Stayner Lillie	Worcester
Jacques Loeb	New York, N. Y.
Richard Swann Lull	New Haven, Conn.
Edward Laurens Mark	Cambridge
Ernest Gale Martin	Palo Alto, Cal.
Albert Davis Mead	Providence, R. I.
Gerrit Smith Miller	Washington, D. C.
Edward Sylvester Morse	Salem
Herbert Vincent Neal	Tufts College
Henry Fairfield Osborn	New York, N. Y.
George Howard Parker	Cambridge
William Patten	Hanover, N. H.
Raymond Pearl	Baltimore, Md.
John Charles Phillips	Wenham
Henry Augustus Pilsbry	Philadelphia, Pa.
Herbert Wilbur Rand	Cambridge
Arthur Clarence Redfield	Boston
William Emerson Ritter	La Jolla, Cal.
Percy Goldthwait Stiles	Newtonville
John Eliot Thayer	Lancaster
William Lyman Underwood	Belmont
Addison Emory Verrill	Whitneyville, Conn.
John Broadus Watson	Washington, D. C.
Arthur Wisswald Weyse	Boston
William Morton Wheeler	Boston

Harris Hawthorne Wilder	Northampton
Edmund Beecher Wilson	New York, N. Y.
Frederick Adams Woods	Brookline
Robert Mearns Yerkes	Washington, D. C.

CLASS II., SECTION IV.—*Medicine and Surgery*.—39.

Edward Hickling Bradford	Boston
Charles Macfie Campbell	Cambridge
Alexis Carrel	New York, N. Y.
Henry Asbury Christian	Boston
Stanley Cobb	Ponkapoag
Rufus Cole	New York, N. Y.
Harvey Cushing	Boston
David Linn Edsall	Cambridge
Simon Flexner	New York, N. Y.
Joseph Lincoln Goodale	Boston
Robert Battey Greenough	Boston
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Henry Jackson	Boston
Elliott Proctor Joslin	Boston
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William James Mayo	Rochester, Minn.
Samuel Jason Mixer	Boston
Francis Weld Peabody	Brookline
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William Lambert Richardson	Boston
Milton Joseph Rosenau	Boston
Frederick Cheever Shattuck	Boston
Theobald Smith	Princeton, N. J.
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Ernest Edward Tyzzer	Wakefield

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John Collins Warren	Boston
William Henry Welch	Baltimore, Md.
Francis Henry Williams	Boston
Simeon Burt Wolbach	Boston
Horatio Curtis Wood	Philadelphia, Pa.

CLASS III.—*Moral and Political Sciences.*—199.

SECTION I.—*Theology, Philosophy and Jurisprudence.*—52.

Thomas Willing Balch	Philadelphia, Pa.
Simeon Eben Baldwin	New Haven, Conn.
Willard Bartlett	Brooklyn, N. Y.
Joseph Henry Beale	Cambridge
Charles Henry Brent	Buffalo, N. Y.
Howard Nicholson Brown	Boston
Charles Warren Clifford	New Bedford
Edmund Burke Delabarre	Providence, R. I.
James De Normandie	Roxbury
Frederic Dodge	Belmont
Edward Staples Drown	Cambridge
William Harrison Dunbar	Cambridge
William Herbert Perry Faunce	Providence, R. I.
William Wallace Fenn	Cambridge
Frederick Perry Fish	Brookline
Paul Revere Frothingham	Boston
George Angier Gordon	Boston
Alfred Hemenway	Boston
William Ernest Hocking	Cambridge
Charles Evans Hughes	Washington, D. C.
Frederick John Foakes Jackson	New York, N. Y.
Charles Francis Jenney	Boston
William Lawrence	Boston
Frederick Lawton	Boston
Arthur Lord	Plymouth

William Caleb Loring	Boston
Nathan Matthews	Boston
William McDougall	Cambridge
Samuel Walker McCall	Winchester
Edward Caldwell Moore	Cambridge
John Bassett Moore	New York, N. Y.
James Madison Morton	Fall River
George Herbert Palmer	Cambridge
Charles Edwards Park	Boston
Leighton Parks	New York, N. Y.
Francis Greenwood Peabody	Cambridge
George Wharton Pepper	Philadelphia, Pa.
Roscoe Pound	Belmont
Elihu Root	New York, N. Y.
James Hardy Ropes	Cambridge
Arthur Prentice Rugg	Worcester
Austin Wakeman Scott	Cambridge
Henry Newton Sheldon	Boston
Moorfield Storey	Boston
William Howard Taft	New Haven, Conn.
William Jewett Tucker	Hanover, N. H.
William Cushing Wait	Medford
Eugene Wambaugh	Cambridge
Edward Henry Warren	Brookline
Winslow Warren	Dedham
Samuel Williston	Belmont
Woodrow Wilson	Washington, D. C.

CLASS III., SECTION II.—*Philology and Archæology.*—56.

Francis Greenleaf Allinson	Providence, R. I.
William Rosenzweig Arnold	Cambridge
Maurice Bloomfield	Baltimore, Md.
Franz Boas	New York, N. Y.
Carl Darling Buck	Chicago, Ill.
Eugene Watson Burlingame	Albany, N. Y.
Edward Capps	Princeton, N. J.
George Henry Chase	Cambridge

Walter Eugene Clark	Chicago, Ill.
Roland Burrage Dixon	Cambridge
Franklin Edgerton	Philadelphia, Pa.
William Curtis Farabee	Philadelphia, Pa.
Jesse Walter Fewkes	Washington, D. C.
Jeremiah Denis Mathias Ford	Cambridge
Basil Lanneau Gildersleeve	Baltimore, Md.
Pliny Earle Goddard	New York, N. Y.
Charles Hall Grandgent	Cambridge
Louis Herbert Gray	New York, N. Y.
Charles Burton Gulick	Cambridge
Roy Kenneth Hack	Cambridge
William Arthur Heidel	Middletown, Conn.
George Lincoln Hendrickson	New Haven, Conn.
Bert Hodge Hill	Athens, Greece
Elijah Clarence Hills	Bloomington, Ind.
William Henry Holmes	Washington, D. C.
Edward Washburn Hopkins	New Haven, Conn.
Joseph Clark Hoppin	Pomfret, Conn.
Albert Andrew Howard	Cambridge
William Guild Howard	Cambridge
Aleš Hrdlička	Washington, D. C.
Eugene Xavier Louis Henry Hyvernât	Washington, D. C.
Carl Newell Jackson	Cambridge
Hans Carl Gunther von Jagemann	Cambridge
James Richard Jewett	Cambridge
Alfred Louis Kroeber	Berkeley, Cal.
Kirsopp Lake	Cambridge
Henry Roseman Lang	New Haven, Conn.
Charles Rockwell Lanman	Cambridge
John Livingston Lowes	Cambridge
David Gordon Lyon	Cambridge
Clifford Herschel Moore	Cambridge
George Foot Moore	Cambridge
Hanns Oertel	New Haven, Conn.
Chandler Rathfon Post	Cambridge
Edward Kennard Rand	Cambridge
George Andrew Reisner	Cambridge

Edward Robinson	New York, N. Y.
Fred Norris Robinson	Cambridge
Rudolph Schevill	Berkeley, Cal.
Edward Stevens Sheldon	Cambridge
Herbert Weir Smyth	Cambridge
Franklin Bache Stephenson	Washington, D. C.
Charles Cutler Torrey	New Haven, Conn.
Alfred Marston Tozzer	Cambridge
Clark Wissler	New York, N. Y.
James Haughton Woods	Cambridge

CLASS III., SECTION III.—*Political Economy and History.*—45.

Wilbur Cortez Abbott	Cambridge
Brooks Adams	Quincy
George Burton Adams	New Haven, Conn.
Charles McLean Andrews	New Haven, Conn.
John Spencer Bassett	Northampton
Charles Jesse Bullock	Cambridge
Thomas Nixon Carver	Cambridge
Edward Channing	Cambridge
John Bates Clark	New York, N. Y.
Archibald Cary Coolidge	Boston
Richard Henry Dana	Cambridge
Clive Day	New Haven, Conn.
Davis Rich Dewey	Cambridge
Ephraim Emerton	Cambridge
Henry Walcott Farnam	New Haven, Conn.
Max Farrand	New Haven, Conn.
William Scott Ferguson	Cambridge
Irving Fisher	New Haven, Conn.
Worthington Chauncey Ford	Cambridge
Edwin Francis Gay	New York, N. Y.
Frank Johnson Goodnow	Baltimore, Md.
Evarts Boutell Greene	Champaign, Ill.
Arthur Twining Hadley	New Haven, Conn.
Albert Bushnell Hart	Cambridge
Charles Homer Haskins	Cambridge

Isaac Minis Hays	Philadelphia, Pa.
Charles Downer Hazen	New York, N. Y.
George La Piana	Cambridge
Henry Cabot Lodge	Nahant
Abbott Lawrence Lowell	Cambridge
William MacDonald	New York, N. Y.
Charles Howard McIlwain	Cambridge
Roger Bigelow Merriman	Cambridge
Samuel Eliot Morison	Boston
William Bennett Munro	Cambridge
Charles Lemuel Nichols	Worcester
James Ford Rhodes	Boston
William Milligan Sloane	New York, N. Y.
John Osborne Sumner	Boston
Frank William Taussig	Cambridge
William Roscoe Thayer	Cambridge
Frederick Jackson Turner	Cambridge
George Grafton Wilson	Cambridge
George Parker Winship	Cambridge
Allyn Abbott Young	Cambridge

CLASS III., SECTION IV.—*Literature and the Fine Arts.*—46.

Irving Babbitt	Cambridge
George Pierce Baker	Cambridge
William Sturgis Bigelow	Boston
Le Baron Russell Briggs	Cambridge
Charles Allerton Coolidge	Boston
Frederick Shepherd Converse	Boston
Samuel McChord Crothers	Cambridge
Wilberforce Eames	New York, N. Y.
Edward Waldo Emerson	Concord
William Emerson	Cambridge
Arthur Fairbanks	Cambridge
Frank Edgar Farley	Middleton, Conn.
Arthur Foote	Brookline
Edward Waldo Forbes	Cambridge
Kuno Francke	Gilbertsville, N. Y.

Daniel Chester French	New York, N. Y.
Horace Howard Furness	Philadelphia, Pa.
Robert Grant	Boston
Morris Gray	Boston
Chester Noyes Greenough	Cambridge
James Kendall Hosmer	Minneapolis, Minn.
Mark Antony DeWolfe Howe	Boston
Archer Milton Huntington	New York, N. Y.
George Lyman Kittredge	Cambridge
William Coolidge Lane	Cambridge
John Ellerton Lodge	Boston
Charles Martin Tornov Loeffler	Medfield
Charles Donagh Maginnis	Brookline
Allan Marquand	Princeton, N. J.
Albert Matthews	Boston
Harold Murdock	Brookline
William Allan Neilson	Northampton
Thomas Nelson Page	Washington, D. C.
William Lyon Phelps	New Haven, Conn.
Arthur Kingsley Porter	Cambridge
Herbert Putnam	Washington, D. C.
Denman Waldo Ross	Cambridge
Paul Joseph Sachs	Cambridge
John Singer Sargent	London, Eng.
Ellery Sedgwick	Boston
Henry Dwight Sedgwick	Cambridge
Richard Clipston Sturgis	Boston
Charles Howard Walker	Boston
Owen Wister	Philadelphia, Pa.
George Edward Woodberry	Beverly
Charles Henry Conrad Wright	Cambridge

FOREIGN HONORARY MEMBERS.—71.

(Number limited to seventy-five.)

CLASS I.—*Mathematical and Physical Sciences.*—24.SECTION I.—*Mathematics and Astronomy.*—8.

Johann Oskar Backlund	Petrograd
Arthur Stanley Eddington	Cambridge
Godfrey Harold Hardy	Oxford
Jacques Salomon Hadamard	Paris
Felix Klein	Göttingen
Tullio Levi-Civita	Rome
Charles Emile Picard	Paris
Charles Jean de la Vallée Poussin	Louvain

CLASS I., SECTION II.—*Physics.*—7.

Svante August Arrhenius	Stockholm
Oliver Heaviside	Torquay
Sir Joseph Larmor	Cambridge
Hendrik Antoon Lorentz	Leyden
Max Planck	Berlin
Sir Ernest Rutherford	Manchester
Sir Joseph John Thomson	Cambridge

CLASS I., SECTION III.—*Chemistry.*—4.

Fritz Haber	Berlin
Henri Louis Le Chatelier	Paris
Wilhelm Ostwald	Leipsic
William Henry Perkin	Oxford

CLASS I.—SECTION IV.—*Technology and Engineering.*—5.

Heinrich Müller Breslau	Berlin
Ferdinand Foch	Paris
Joseph Jacques Césaire Joffre	Paris
Vsevolod Jevgenjevic Timonoff	Petrograd
William Cawthorne Unwin	London

CLASS II.—*Natural and Physiological Sciences.*—22.SECTION I.—*Geology, Mineralogy, and Physics of the Globe.*—10.

Frank Dawson Adams	Montreal
Charles Barrois	Lille
Waldemar Christofer Brögger	Christiania
Sir Archibald Geikie	Haslemere, Surrey
Viktor Goldschmidt	Heidelberg
Albert Heim	Zürich
Emanuel de Margerie	Paris
Gustaf Adolf Frederik Molengraaff	Delft
Sir William Napier Shaw	London
Johan Herman Lie Vogt	Trondhjem

CLASS II, SECTION II.—*Botany.*—5.

John Briquet	Geneva
Hugo de Vries	Luntenen
Adolf Engler	Berlin
Ignatz Urban	Berlin
Eugene Warming	Copenhagen

CLASS II.—SECTION III.—*Zoölogy and Physiology.*—3.

Maurice Caullery	Paris
Sir Edwin Ray Lankester	London
George Henry Falkiner Nuttall	Cambridge

CLASS II., SECTION IV.—*Medicine and Surgery.*—4.

Rt. Hon. Sir Thomas Clifford Allbutt	Cambridge
Sir Thomas Barlow, Bart.	London
Francis John Shepherd	Montreal
Charles Scott Sherrington	Oxford

CLASS III.—*Moral and Political Sciences.*—25.SECTION I.—*Theology, Philosophy and Jurisprudence.*—5.

Rt. Hon Arthur James Balfour	Prestonkirk
Heinrich Brunner	Berlin

Albert Venn Dicey	Oxford
Raymond Poincaré	Paris
Rt. Hon. Sir Frederick Pollock, Bart.	London

SECTION II.—*Philology and Archæology.*—9.

Friedrich Delitzsch	Berlin
Hermann Diels	Berlin
Wilhelm Dörpfeld	Athens
Henry Jackson	Cambridge
Hermann Georg Jacobi	Bonn
Arthur Anthony Macdonell	Oxford
Alfred Percival Maudslay	Hereford
Ramon Menendez Pidal	Madrid
Eduard Seler	Berlin

SECTION III.—*Political Economy and History.*—6.

Adolf Harnack	Berlin
Alfred Marshall	Cambridge
Rt. Hon. John Morley, Viscount Morley of Blackburn	London
Henri Pirenne	Ghent
George Walter Prothero	London
Rt. Hon. Sir George Otto Trevelyan, Bart.	London

SECTION IV.—*Literature and the Fine Arts.*—5.

Georg Brandes	Copenhagen
Thomas Hardy	Dorchester
Jean Adrien Antoine Jules Jusserand	Paris
Rudyard Kipling	Burwash
Sir Sidney Lee	London

STATUTES AND STANDING VOTES

STATUTES

Adopted November 8, 1911: amended May 8, 1912, January 8, and May 14, 1913, April 14, 1915, April 12, 1916, April 10, 1918, May 14, 1919, February 8, and April 12, 1922.

CHAPTER I

THE CORPORATE SEAL

ARTICLE 1. The Corporate Seal of the Academy shall be as here depicted:



ARTICLE 2. The Recording Secretary shall have the custody of the Corporate Seal.

See Chap. v. art. 3; chap. vi. art. 2.

CHAPTER II

FELLOWS AND FOREIGN HONORARY MEMBERS AND DUES

ARTICLE 1. The Academy consists of Fellows, who are either citizens or residents of the United States of America, and Foreign Honorary Members. They are arranged in three Classes, according to the Arts and Sciences in which they are severally proficient, and each Class is divided into four Sections, namely:

CLASS I. *The Mathematical and Physical Sciences*

- Section 1. Mathematics and Astronomy
- Section 2. Physics
- Section 3. Chemistry
- Section 4. Technology and Engineering

CLASS II. *The Natural and Physiological Sciences*

- Section 1. Geology, Mineralogy, and Physics of the Globe
- Section 2. Botany
- Section 3. Zoölogy and Physiology
- Section 4. Medicine and Surgery

CLASS III. *The Moral and Political Sciences*

- Section 1. Theology, Philosophy, and Jurisprudence
- Section 2. Philology and Archaeology
- Section 3. Political Economy and History
- Section 4. Literature and the Fine Arts

ARTICLE 2. The number of Fellows shall not exceed Six hundred, of whom not more than Four hundred shall be residents of Massachusetts, nor shall there be more than Two hundred and ten in any one Class.

ARTICLE 3. The number of Foreign Honorary Members shall not exceed Seventy-five. They shall be chosen from among citizens of foreign countries most eminent for their discoveries and attainments in any of the Classes above enumerated. There shall not be more than Twenty-five in any one Class.

ARTICLE 4. If any person, after being notified of his election as Fellow or Resident Associate, shall neglect for six months to accept

in writing, or, if a Fellow resident within fifty miles of Boston shall neglect to pay his Admission Fee, his election shall be void; and if any Fellow resident within fifty miles of Boston or any Resident Associate shall neglect to pay his Annual Dues for six months after they are due, provided his attention shall have been called to this Article of the Statutes in the meantime, he shall cease to be a Fellow or Resident Associate respectively; but the Council may suspend the provisions of this Article for a reasonable time.

With the previous consent of the Council, the Treasurer may dispense (*sub silentio*) with the payment of the Admission Fee or of the Annual Dues or both whenever he shall deem it advisable. In the case of officers of the Army or Navy who are out of the Commonwealth on duty, payment of the Annual Dues may be waived during such absence if continued during the whole financial year and if notification of such expected absence be sent to the Treasurer. Upon similar notification to the Treasurer, similar exemption may be accorded to Fellows or Resident Associates subject to Annual Dues, who may temporarily remove their residence for at least two years to a place more than fifty miles from Boston.

If any person elected a Foreign Honorary Member shall neglect for six months after being notified of his election to accept in writing, his election shall be void.

See Chap. vii. art. 2.

ARTICLE 5. Every Fellow resident within fifty miles of Boston hereafter elected shall pay an Admission Fee of Ten dollars.

Every Fellow resident within fifty miles of Boston shall, and others may, pay such Annual Dues, not exceeding Fifteen dollars, as shall be voted by the Academy at each Annual Meeting, when they shall become due; but any Fellow or Resident Associate shall be exempt from the annual payment if, at any time after his admission, he shall pay into the treasury Two hundred dollars in addition to his previous payments.

All Commutations of the Annual Dues shall be and remain permanently funded, the interest only to be used for current expenses.

Any Fellow not previously subject to Annual Dues who takes up his residence within fifty miles of Boston, shall pay to the Treasurer within three months thereafter Annual Dues for the current year, failing which

his Fellowship shall cease; but the Council may suspend the provisions of this Article for a reasonable time.

Only Fellows who pay Annual Dues or have commuted them may hold office in the Academy or serve on the Standing Committees or vote at meetings.

ARTICLE 6. Fellows who pay or have commuted the Annual Dues and Foreign Honorary Members shall be entitled to receive gratis one copy of all Publications of the Academy issued after their election.

See Chap. x, art. 2.

ARTICLE 7. Diplomas signed by the President and the Vice-President of the Class to which the member belongs, and countersigned by the Secretaries, shall be given to Foreign Honorary Members and to Fellows on request.

ARTICLE 8. If, in the opinion of a majority of the entire Council, any Fellow or Foreign Honorary Member or Resident Associate shall have rendered himself unworthy of a place in the Academy, the Council shall recommend to the Academy the termination of his membership; and if three fourths of the Fellows present, out of a total attendance of not less than fifty at a Stated Meeting, or at a Special Meeting called for the purpose, shall adopt this recommendation, his name shall be stricken from the Roll.

See Chap. iii.; chap. vi. art. 1; chap. ix, art. 1, 7; chap. x. art. 2.

CHAPTER III

ELECTION OF FELLOWS AND FOREIGN HONORARY MEMBERS

ARTICLE 1. Elections of Fellows and Foreign Honorary Members shall be made by the Council in April of each year, and announced at the Annual Meeting in May.

ARTICLE 2. Nominations to Fellowship or Foreign Honorary Membership in any Section must be signed by two Fellows of that Section or by three voting Fellows of any Sections; but in any one year no Fellow may nominate more than four persons. These nominations, with statements of qualifications and brief biographical data, shall be sent to the Corresponding Secretary.

All nominations thus received prior to February 15 shall be forthwith sent in printed form to every Fellow, with the names of the proposers in each case and a brief account of each nominee, and with the request that the list be returned before March 15, marked to indicate preferences of the voter in such manner as the Council may direct.

All the nominations, with any comments thereon and with the results of the preferential indications of the Fellows, received by March 15, shall be referred at once to the appropriate Class Committees, which shall report their decisions to the Council, which shall thereupon have power to elect.

Persons nominated in any year, but not elected, may be placed on the preferential ballot of the next year at the discretion of the Council, but shall not further be continued on the list of nominees unless renominated.

Notice shall be sent to every Fellow not later than the fifteenth of January, of each year, calling attention to the fact that the limit of time for sending nominations to the Corresponding Secretary will expire on the fifteenth of February.

See Chap. ii.; chap. vi. art. 1; chap. ix. art. 1.

CHAPTER IV

OFFICERS

ARTICLE 1. The Officers of the Academy shall be a President (who shall be Chairman of the Council), three Vice-Presidents (one from each Class), a Corresponding Secretary (who shall be Secretary of the Council), a Recording Secretary, a Treasurer, and a Librarian, all of whom shall be elected by ballot at the Annual Meeting, and shall hold their respective offices for one year, and until others are duly chosen and installed.

There shall be also twelve Councillors, one from each Section of each Class. At each Annual Meeting three Councillors, one from each Class, shall be elected by ballot to serve for the full term of four years and until others are duly chosen and installed. The same Fellow shall not be eligible for two successive terms.

The Councillors, with the other officers previously named, and the Chairman of the House Committee, *ex officio*, shall constitute the Council.

See Chap. x, art. 1.

ARTICLE 2. If any officer be unable, through death, absence, or disability, to fulfil the duties of his office, or if he shall resign, his place may be filled by the Council in its discretion for any part or the whole of the unexpired term.

ARTICLE 3. At the Stated Meeting in March, the President shall appoint a Nominating Committee of three Fellows having the right to vote, one from each Class. This Committee shall prepare a list of nominees for the several offices to be filled, and for the Standing Committees, and file it with the Recording Secretary not later than four weeks before the Annual Meeting.

See Chap. vi. art. 2.

ARTICLE 4. Independent nominations for any office, if signed by at least twenty Fellows having the right to vote, and received by the Recording Secretary not less than ten days before the Annual Meeting, shall be inserted in the call therefor, and shall be mailed to all the Fellows having the right to vote.

See Chap. vi. art. 2.

ARTICLE 5. The Recording Secretary shall prepare for use in voting at the Annual Meeting a ballot containing the names of all persons duly nominated for office.

CHAPTER V

THE PRESIDENT

ARTICLE 1. The President, or in his absence the senior Vice-President present (seniority to be determined by length of continuous fellowship in the Academy), shall preside at all meetings of the Academy. In the absence of all these officers, a Chairman of the meeting shall be chosen by ballot.

ARTICLE 2. Unless otherwise ordered, all Committees which are not elected by ballot shall be appointed by the presiding officer.

ARTICLE 3. Any deed or writing to which the Corporate Seal is to be affixed, except leases of real estate, shall be executed in the name of the Academy by the President or, in the event of his death, absence, or inability, by one of the Vice-Presidents, when thereto duly authorized.

See Chap. ii. art. 7; chap. iv. art. 1, 3; chap. vi. art. 2; chap. vii. art. 1; chap. ix. art. 6; chap. x. art. 1, 2; chap. xi. art. 1.

CHAPTER VI

THE SECRETARIES

ARTICLE 1. The Corresponding Secretary shall conduct the correspondence of the Academy and of the Council, recording or making an entry of all letters written in its name, and preserving for the files all official papers which may be received. At each meeting of the Council he shall present the communications addressed to the Academy which have been received since the previous meeting, and at the next meeting of the Academy he shall present such as the Council may determine.

He shall notify all persons who may be elected Fellows or Foreign Honorary Members, or Resident Associates, send to each a copy of the Statutes, and on their acceptance issue the proper Diploma. He shall also notify all meetings of the Council; and in case of the death, absence, or inability of the Recording Secretary he shall notify all meetings of the Academy.

Under the direction of the Council, he shall keep a List of the Fellows, Foreign Honorary Members, and Resident Associates, arranged in their several Classes and Sections. It shall be printed annually and issued as of the first day of July.

See Chap. ii. art. 7; chap. iii. art. 2, 3; chap. iv. art. 1; chap. ix. art. 6; chap. x. art. 1; chap. xi. art. 1.

ARTICLE 2. The Recording Secretary shall have the custody of the Charter, Corporate Seal, Archives, Statute-Book, Journals, and all literary papers belonging to the Academy.

Fellows or Resident Associates borrowing such papers or documents shall receipt for them to their custodian.

The Recording Secretary shall attend the meetings of the Academy and keep a faithful record of the proceedings with the names of the Fellows and Resident Associates present; and after each meeting is duly opened, he shall read the record of the preceding meeting.

He shall notify the meetings of the Academy to each Fellow and Resident Associate by mail at least seven days beforehand, and in his discretion may also cause the meetings to be advertised; he shall apprise Officers and Committees of their election or appointment, and inform the Treasurer of appropriations of money voted by the Academy.

After all elections, he shall insert in the Records the names of the Fellows by whom the successful nominees were proposed.

He shall send the Report of the Nominating Committee in print to every Fellow having the right to vote at least three weeks before the Annual Meeting.

See Chap. iv. art. 3.

In the absence of the President and of the Vice-Presidents he shall, if present, call the meeting to order, and preside until a Chairman is chosen.

See Chap. i.; chap. ii. art. 7; chap. iv. art. 3, 4, 5; chap. ix. art. 6; chap. x. art. 1, 2; chap. xi. art. 1, 3.

ARTICLE 3. The Secretaries, with the Chairman of the Committee of Publication, shall have authority to publish such of the records of the meetings of the Academy as may seem to them likely to promote its interests.

CHAPTER VII

THE TREASURER AND THE TREASURY

ARTICLE 1. The Treasurer shall collect all money due or payable to the Academy, and all gifts and bequests made to it. He shall pay all bills due by the Academy, when approved by the proper officers, except those of the Treasurer's office, which may be paid without such approval; in the name of the Academy he shall sign all leases of real estate; and, with the written consent of a member of the Committee on Finance, he shall make all transfers of stocks, bonds, and other

securities belonging to the Academy, all of which shall be in his official custody.

He shall keep a faithful account of all receipts and expenditures, submit his accounts annually to the Auditing Committee, and render them at the expiration of his term of office, or whenever required to do so by the Academy or the Council.

He shall keep separate accounts of the income of the Rumford Fund, and of all other special Funds, and of the appropriation thereof, and render them annually.

His accounts shall always be open to the inspection of the Council.

ARTICLE 2. He shall report annually to the Council at its March meeting on the expected income of the various Funds and from all other sources during the ensuing financial year. He shall also report the names of all Fellows and Resident Associates who may be then delinquent in the payment of their Annual Dues.

ARTICLE 3. He shall give such security for the trust reposed in him as the Academy may require.

ARTICLE 4. With the approval of a majority of the Committee on Finance, he may appoint an Assistant Treasurer to perform his duties, for whose acts, as such assistant, he shall be responsible; or, with like approval and responsibility, he may employ any Trust Company doing business in Boston as his agent for the same purpose, the compensation of such Assistant Treasurer or agent to be fixed by the Committee on Finance and paid from the funds of the Academy.

ARTICLE 5. At the Annual Meeting he shall report in print all his official doings for the preceding year, stating the amount and condition of all the property of the Academy entrusted to him, and the character of the investments.

ARTICLE 6. The Financial Year of the Academy shall begin with the first day of April.

ARTICLE 7. No person or committee shall incur any debt or liability in the name of the Academy, unless in accordance with a previous vote and appropriation therefor by the Academy or the Council, or sell or otherwise dispose of any property of the Academy,

except cash or invested funds, without the previous consent and approval of the Council.

See Chap. ii. art. 4, 5; chap. vi. art. 2; chap. ix. art. 6; chap. x. art. 1, 2, 3; chap. xi. art. 1.

CHAPTER VIII

THE LIBRARIAN AND THE LIBRARY.

ARTICLE 1. The Librarian shall have charge of the printed books, keep a correct catalogue thereof, and provide for their delivery from the Library.

At the Annual Meeting, as Chairman of the Committee on the Library, he shall make a Report on its condition.

ARTICLE 2. In conjunction with the Committee on the Library he shall have authority to expend such sums as may be appropriated by the Academy for the purchase of books, periodicals, etc., and for defraying other necessary expenses connected with the Library.

ARTICLE 3. All books procured from the income of the Rumford Fund or of other special Funds shall contain a book-plate expressing the fact.

ARTICLE 4. Books taken from the Library shall be receipted for to the Librarian or his assistant.

ARTICLE 5. Books shall be returned in good order, regard being had to necessary wear with good usage. If any book shall be lost or injured, the Fellow or Resident Associate to whom it stands charged shall replace it by a new volume or by a new set, if it belongs to a set, or pay the current price thereof to the Librarian, whereupon the remainder of the set, if any, shall be delivered to the Fellow or Resident Associate so paying, unless such remainder be valuable by reason of association.

ARTICLE 6. All books shall be returned to the Library for examination at least one week before the Annual Meeting.

ARTICLE 7. The Librarian shall have the custody of the Publications of the Academy. With the advice and consent of the President, he may effect exchanges with other associations.

See Chap. ii. art. 6; chap. x. art. 1, 2.

CHAPTER IX

THE COUNCIL

ARTICLE 1. The Council shall exercise a discreet supervision over all nominations and elections to membership, and in general supervise all the affairs of the Academy not explicitly reserved to the Academy as a whole or entrusted by it or by the Statutes to standing or special committees.

It shall consider all nominations duly sent to it by any Class Committee, and act upon them in accordance with the provisions of Chapter III.

With the consent of the Fellow interested, it shall have power to make transfers between the several Sections, reporting its action to the Academy.

See Chap. iii. art. 2, 3; chap. x. art. 1.

ARTICLE 2. Seven members shall constitute a quorum.

ARTICLE 3. It shall establish rules and regulations for the transaction of its business, and provide all printed and engraved blanks and books of record.

ARTICLE 4. It shall act upon all resignations of officers, and all resignations and forfeitures of Fellowship or Resident Associateship; and cause the Statutes to be faithfully executed.

It shall appoint all agents and subordinates not otherwise provided for by the Statutes, prescribe their duties, and fix their compensation. They shall hold their respective positions during the pleasure of the Council.

ARTICLE 5. It may appoint, for terms not exceeding one year, and prescribe the functions of, such committees of its number, or of the Fellows of the Academy, as it may deem expedient, to facilitate the administration of the affairs of the Academy or to promote its interests.

ARTICLE 6. At its March meeting it shall receive reports from the President, the Secretaries, the Treasurer, and the Standing Committees, on the appropriations severally needed for the ensuing financial year. At the same meeting the Treasurer shall report on the expected income of the various Funds and from all other sources during the same year.

A report from the Council shall be submitted to the Academy, for action, at the March meeting, recommending the appropriation which in the opinion of the Council should be made.

On the recommendation of the Council, special appropriations may be made at any Stated Meeting of the Academy, or at a Special Meeting called for the purpose.

See Chap. x. art. 3.

ARTICLE 7. After the death of a Fellow or Foreign Honorary Member, it shall appoint a member of the Academy to prepare a biographical notice for publication in the Proceedings.

ARTICLE 8. It shall report at every meeting of the Academy such business as it may deem advisable to present.

See Chap. ii. art. 4, 5, 8; chap. iv. art. 1, 2; chap. vi. art. 1; chap. vii. art. 1; chap. xi. art. 1, 4.

CHAPTER X

STANDING COMMITTEES

ARTICLE 1. The Class Committee of each Class shall consist of the Vice-President, who shall be chairman, and the four Councillors of the Class, together with such other officer or officers annually elected as may belong to the Class. It shall consider nominations to Fellowship in its own Class, and report in writing to the Council such as may receive at a Class Committee Meeting a majority of the votes cast, provided at least three shall have been in the affirmative.

See Chap. iii. art. 2.

ARTICLE 2. At the Annual Meeting the following Standing Committees shall be elected by ballot to serve for the ensuing year:

(i) *The Committee on Finance*, to consist of three Fellows, who, through the Treasurer, shall have full control and management of the funds and trusts of the Academy, with the power of investing the funds and of changing the investments thereof in their discretion.

See Chap. iv. art. 3; chap. vii. art. 1, 4; chap. ix. art. 6.

(ii) *The Rumford Committee*, to consist of seven Fellows, who shall report to the Academy on all applications and claims for the

Rumford Premium. It alone shall authorize the purchase of books, publications and apparatus at the charge of the income from the Rumford Fund, and generally shall see to the proper execution of the trust.

See Chap. iv. art. 3; chap. ix. art. 6.

(iii) *The Cyrus Moors Warren Committee*, to consist of seven Fellows, who shall consider all applications for appropriations from the income of the Cyrus Moors Warren Fund, and generally shall see to the proper execution of the trust.

See Chap. iv. art. 3; chap. ix. art. 6.

(iv) *The Committee of Publication*, to consist of three Fellows, one from each Class, to whom all communications submitted to the Academy for publication shall be referred, and to whom the printing of the Proceedings and the Memoirs shall be entrusted.

It shall fix the price at which the Publications shall be sold; but Fellows may be supplied at half price with volumes which may be needed to complete their sets, but which they are not entitled to receive gratis.

Two hundred extra copies of each paper accepted for publication in the Proceedings or the Memoirs shall be placed at the disposal of the author without charge.

See Chap. iv. art. 3; chap. vi. art. 1, 3; chap. ix. art. 6.

(v) *The Committee on the Library*, to consist of the Librarian, *ex officio*, as Chairman, and three other Fellows, one from each Class, who shall examine the Library and make an annual report on its condition and management.

See Chap. iv. art. 3; chap. viii. art. 1, 2; chap. ix. art. 6.

(vi) *The House Committee*, to consist of three Fellows, who shall have charge of all expenses connected with the House, including the general expenses of the Academy not specifically assigned to the care of other Committees or Officers.

See Chap. iv. art. 1, 3; chap. ix. art. 6.

(vii) *The Committee on Meetings*, to consist of the President, the Recording Secretary, and three other Fellows, who shall have charge of plans for meetings of the Academy.

See Chap. iv. art. 3; chap. ix. art. 6.

(viii) *The Auditing Committee*, to consist of two Fellows, who shall audit the accounts of the Treasurer, with power to employ an expert and to approve his bill.

See Chap. iv. art. 3; chap. vii. art. 1; chap. ix. art. 6.

ARTICLE 3. The Standing Committees shall report annually to the Council in March on the appropriations severally needed for the ensuing financial year; and all bills incurred on account of these Committees, within the limits of the several appropriations made by the Academy, shall be approved by their respective Chairmen.

In the absence of the Chairman of any Committee, bills may be approved by any member of the Committee whom he shall designate for the purpose.

See Chap. vii. art. 1, 7; chap. ix. art. 6.

CHAPTER XI

MEETINGS, COMMUNICATIONS, AND AMENDMENTS

ARTICLE 1. There shall be annually eight Stated Meetings of the Academy, namely, on the second Wednesday of October, November, December, January, February, March, April and May. Only at these meetings, or at adjournments thereof regularly notified, or at Special Meetings called for the purpose, shall appropriations of money be made or amendments of the Statutes or Standing Votes be effected.

The Stated Meeting in May shall be the Annual Meeting of the Corporation.

Special Meetings shall be called by either of the Secretaries at the request of the President, of a Vice-President, of the Council, or of ten Fellows having the right to vote; and notifications thereof shall state the purpose for which the meeting is called.

A meeting for receiving and discussing literary or scientific communications may be held on the fourth Wednesday of each month, excepting July, August, and September; but no business shall be transacted at said meetings.

ARTICLE 2. Twenty Fellows having the right to vote shall constitute a quorum for the transaction of business at Stated or Special

Meetings. Fifteen Fellows shall be sufficient to constitute a meeting for literary or scientific communications and discussions.

ARTICLE 3. Upon the request of the presiding officer or the Recording Secretary, any motion or resolution offered at any meeting shall be submitted in writing.

ARTICLE 4. No report of any paper presented at a meeting of the Academy shall be published by any Fellow or Resident Associate without the consent of the author; and no report shall in any case be published by any Fellow or Resident Associate in a newspaper as an account of the proceedings of the Academy without the previous consent and approval of the Council. The Council, in its discretion, by a duly recorded vote, may delegate its authority in this regard to one or more of its members.

ARTICLE 5. No Fellow or Resident Associate shall introduce a guest at any meeting of the Academy until after the business has been transacted, and especially until after the result of the balloting upon nominations has been declared.

ARTICLE 6. The Academy shall not express its judgment on literary or scientific memoirs or performances submitted to it, or included in its Publications.

ARTICLE 7. All proposed Amendments of the Statutes shall be referred to a committee, and on its report, at a subsequent Stated Meeting or at a Special Meeting called for the purpose, two thirds of the ballot cast, and not less than twenty, must be affirmative to effect enactment.

ARTICLE 8. Standing Votes may be passed, amended, or rescinded at a Stated Meeting, or at a Special Meeting called for the purpose, by a vote of two thirds of the members present. They may be suspended by a unanimous vote.

See Chap. ii. art. 5, 8; chap. iii. chap. iv. art. 3, 4, 5; chap. v. art. 1; chap. vi. art. 1, 2; chap. ix. art. 8.

STANDING VOTES

1. Communications of which notice has been given to either of the Secretaries shall take precedence of those not so notified.

2. Fellows or Resident Associates may take from the Library six volumes at any one time, and may retain them for three months, and no longer. Upon special application, and for adequate reasons assigned, the Librarian may permit a larger number of volumes, not exceeding twelve, to be drawn from the Library for a limited period.

3. Works published in numbers, when unbound, shall not be taken from the Hall of the Academy without the leave of the Librarian.

4. There may be chosen by the Academy, under such rules as the Council may determine, one hundred Resident Associates. Not more than forty Resident Associates shall be chosen in any one Class.

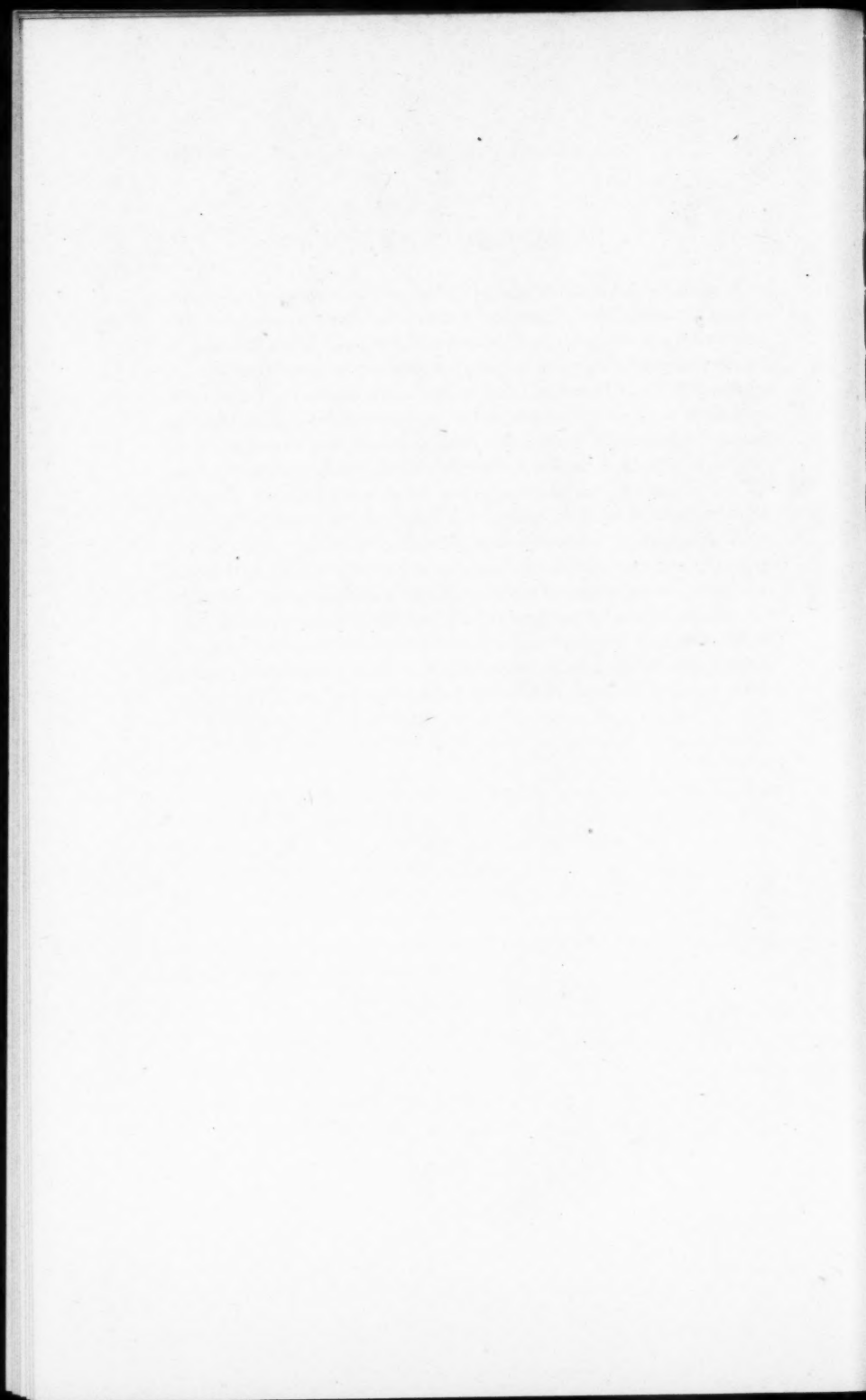
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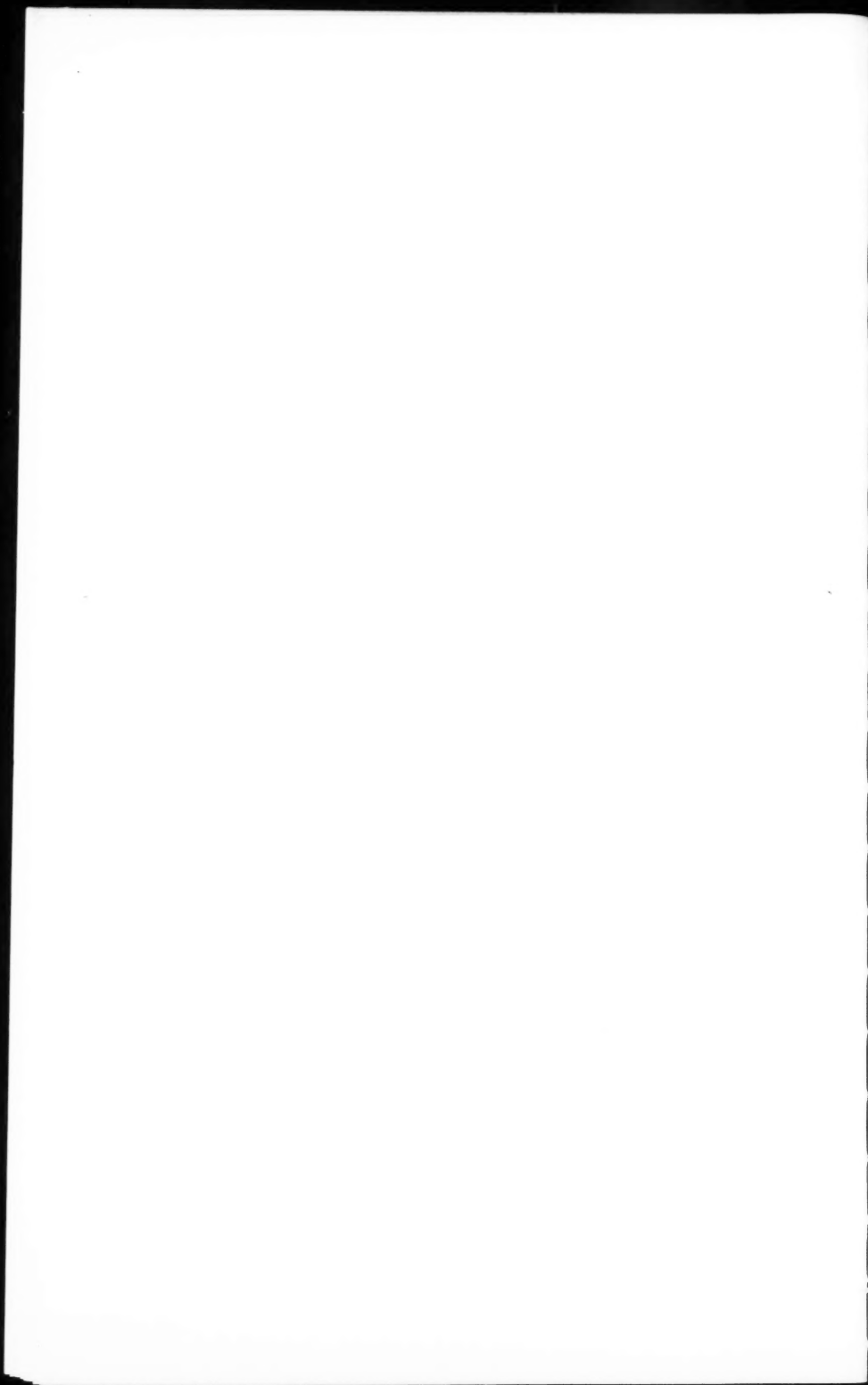
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